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DECEMBER 1944

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MONTHLY WEATHER REVIEW

Editor, EDGAR W. WOOLARD

VOL. 72, No. 12
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DECEMBER 1944

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NORTH ATLANTIC HURRICANES AND TROPICAL DISTURBANCES OF 1944

By H. C. SUMNER

[Weather Bureau, Washington, D. C., December 1944]

THE intense Atlantic coast hurricane of September 8–16 and the Florida-Cuba storm of October 13–21, each of which wrought damage in excess of $100,000,000, carried the hurricane season of 1944 into second position among the most destructive years of record. The historical New England hurricane of September 17–21, 1938, which from the viewpoint of property damage was probably the greatest natural disaster ever to befall the country, placed the season of 1938 at the top of the list. Other seasons have been more costly in the loss of human life, notably that of 1900 during which the great Galveston hurricane caused the death of about 6,000 persons.

Although the number of tropical disturbances detected during the past season was only slightly above the average of 8.6 storms per year for the last decade, the season of 1944 was notable for the high percentage of storms that developed full hurricane winds along the Atlantic coast north of Florida. No tropical disturbances of any consequence struck the Gulf coast of the United States west of Florida, although two hurricanes moved inland on the Mexican east coast and caused considerable damage.

Aircraft reconnaissance which was inaugurated during the 1943 season was extensively used for securing early fixes on tropical disturbances during the past year, and brought the Hurricane Warning Service an excellent new tool for detecting the presence and probable movement of tropical hurricanes.

Below are reviews of the individual hurricanes and tropical disturbances of 1944 taken in the main from station reports. A synopsis of some of the more important features of these storms is given in the tabular listing at the end of this summary; and their tracks numbered I to X, chronologically, are plotted on the accompanying chart.

I. *Tropical disturbance of July 12–19.*—The first tropical storm of the season developed east of the Bahama Islands on the 14th of July from a wave disturbance that had been traced from the eastern Caribbean Sea, where it was first noted near the Grenada Islands on the 11th. It moved through Mona Passage on the evening of the 12th without showing signs of development. The first evidence of increasing intensity was noted as it neared Turks Island on the 13th, and by the 14th a definite circular wind pattern had been established. At this time the Bahama Islands were reporting fairly high ocean swells moving on the coast at the rate of about six per minute.

Moving north-northwestward and increasing slowly in intensity the center reached a position near latitude 31° to 32° N., longitude 76° W., by the evening of the 15th, at which time a slowing of progressive movement was evident and the subsequent recurve toward the northeast began. Bermuda reported winds of approximately 40 miles per hour as the center passed about 250 miles to the northwest of that station. No strong winds were reported from stations along the east coast of the United States. Although no actual observations of hurricane winds are available over ocean areas, it is believed that this storm was of hurricane force from about the time it curved to the northeastward.

II. *Tropical storm—July 24–26.*—On July 24 a small disturbance was noted east of Martinique and Santa Lucia. About 7 p. m.[1] of that date the center passed between those islands and a maximum wind of 55 miles per hour was reported from Fort de France, a town which had been all but destroyed by the disastrous hurricane of August 1891.

The disturbance moved rather rapidly west-northwestward and was located by aircraft reconnaissance near latitude 16° N., longitude 67° W., at 2:30 p. m. on the 25th. After this fix the center was not again definitely located, but there were positive evidences that it was near the coast of Haiti not far south of Port au Prince on the morning of the 26th. A wind of 70 knots was encountered by an airplane near this point (exact location and elevation unknown), and the Port au Prince upper air soundings showed winds aloft of hurricane force, with squalls of 35 miles per hour at the surface. "Considerable damage" was reported from the town of Jacmel on the coast south of Port au Prince. Indications are that the small center struck the high mountains of the Haitian Peninsula and was broken up. It is not believed that winds of hurricane force accompanied this storm at the surface, but that velocities of about 60 miles per hour marked its entire course.

III. *Hurricane—July 30–August 4.*—The first tropical storm of 1944 to reach the coast line of the United States formed east of the Bahamas during the night of July 30–31 from a wave that, during the previous 2 days, had moved from the region northeast of Puerto Rico. The center was definitely located by reconnaissance about 175 miles northeast of Nassau at about 7 a. m. on the 31st. Moving north-northwestward the storm approached the North Carolina coast with slowly increasing intensity and moved inland south of Southport at about 7 p. m. on August 1. The diameter of the storm was small but reports indicate that winds were of hurricane force.

The Coast Guard station on Oak Island reported a wind of 59 miles per hour before the wind indicator failed at 4:30 p. m. Winds increased thereafter and at about 5:50 p. m. were estimated at 70 to 80 miles per hour. The lowest observed pressure 29.22 inches (989.5 millibars) occurred on Oak Island at 6:30 p. m.

The Wilmington Weather Bureau Office, located about 20 miles inland, reported a maximum velocity (maintained for a 5-minute period) of 46 miles per hour, an extreme

[1] All times referred to in this summary are eastern standard.

velocity of 52 miles per hour, and a lowest pressure of 29.43 inches (996.6 millibars).

Damage to property and crops in the Wilmington area has been estimated at about $2,000,000. On the beaches, particularly at Carolina and Wrightsville, many houses and cottages were destroyed or had their foundations undermined by high tides and extremely high seas. Substantially built structures not subject to undermining by water action went through the storm without damage. A guest at the Ocean Terrace Hotel, Wrightsville Beach, who had retired early, awoke the morning after the storm and found, after a sound night's sleep, that she was the sole occupant of a hotel from which everyone else had been evacuated. Property losses in the city of Wilmington have been reported as totaling about $60,000, and in Southport the damage figure has been placed at $10,000. Slight storm damage was reported from the beaches north of Wilmington.

Crop damage was heaviest in the counties of New Hanover, Brunswick, Onslow, and Pender. The county agent of New Hanover County has estimated crop losses for the entire area at $1,269,000.

More than 10,000 persons were evacuated from beaches and exposed locations in advance of the storm, and as a result no lives were lost and few serious injuries were reported.

Moving north from the Wilmington area the center began a recurve to the northeastward, passed near Richmond and Washington about noon of the 2d, and moved out to sea near Atlantic City where an extreme wind of 38 miles per hour was recorded during the afternoon of the same day. At Washington, 6.15 inches of rain fell during a 24-hour period as the storm center passed east of that city. This amount, the second heaviest 24-hour fall in 71 years of record at that station, is exceeded only by the 7.31 inches that accompanied passage of an earlier hurricane on August 11–12, 1928. There is no indication that the storm regained intensity over the ocean as it skirted the southern New England coast.

IV. *Hurricane of August 16–23.*—This small intense storm was first noted east of Barbados on the 16th. Passing south of Barbados and over the Grenada Islands during the night, it entered the Caribbean not far from St. Vincent about 8:30 a. m. on the 17th.

On the morning of August 18, a vessel, en route from New Orleans to Buenos Aires, was heavily involved in the storm near 15°10′ N., 66°40′ W. or about 180 miles south of Puerto Rico. The master reported a low barometer reading of 28.74 inches (973.3 millibars) which coincided in time with a 5-to 10-minute calm which accompanied passage of the storm center. A fall in barometric pressure of 40 millibars in 3 hours preceded the low reading and a similar rise in the same space of time followed passage of the center. Winds were estimated at 70 to 90 miles per hour with ceiling and visibility zero. Even with full speed ahead to reduce pounding on the port side it was virtually impossible to keep the vessel of 8,498 gross tons, and a maximum speed of 14 knots, headed into the wind since the ship was swung to-and-fro by the force of the wind and sea.

Following its west-northwest course the hurricane swept inland over the southeast coast of Jamaica, in the Boston Bay area, shortly before noon on the 20th and passed off the western coast near Montego Bay some hours later. The storm lost much of its intensity as it crossed the island, for winds fell from an estimated 100 to 120 miles per hour on the east coast to 80 miles per hour in the vicinity of Montego Bay where damage was not serious. Kingston in the right-hand semicircle of lesser winds reported a maximum of 60 miles per hour from the west-southwest and a low pressure of 29.50 inches (999.0 millibars). Heaviest damage occurred in the main banana and coconut belt, two crops which are among the most important on the Island. Press photos show that on some of the large coconut plantations, in the more seriously affected areas, not a tree was left standing.

The hurricane center passed near Grand Cayman Island on the 21st with winds of 80 to 90 miles per hour, in gusts, and more than 20 gusts over 80 miles per hour reported. No damage reports have been received from Grand Cayman.

On the morning of the 22d the center moved inland on the west coast of Yucatan a short distance south of Cozumel Island, and while it lost force in passing over the Peninsula, it emerged into the Gulf of Mexico intact and moved westward into Mexico a short distance south of Tuxpan. According to press reports at least 12 deaths were caused inland in Mexico as a result of floods that accompanied dissipation of the storm.

A conservative estimate of fatalities resulting from this hurricane, taken from incomplete statistics, places loss of life at 216. Marine casualties include a British sailing vessel which disappeared near the Grenada Islands with 74 persons aboard, all of whom are presumed lost; and the 110-foot motorship *Island Trader*, out of Miami for Belize, which was reported lost off Yucatan without details of loss of life and cargo being given. In addition various degrees of damage have been reported from other ships.

Estimates of property damage are incomplete but will total several million dollars. Extremely heavy crop losses were suffered on Jamaica, where a crippling blow was dealt growers, exporters, and industrialists dependent upon the highly important banana and coconut yields. The most authoritative estimate of the number of coconut trees destroyed on the whole Island is 41 percent, while banana trees which were concentrated in the stricken zone, were about 90 percent destroyed. Damage figures for other areas affected by the hurricane are not available.

V. *Minor tropical disturbance of August 20–22.*—Development of a circulation and an increase in intensity was noted north of the Yucatan Peninsula, in an isallobaric wave that for some time had been moving westward through the Caribbean. The disturbance continued a westward or west-northwestward movement and crossed the Mexican coast south of Brownsville about noon of the 22d. Highest winds observed at coastal stations were 34 miles per hour at Fort Isabel and 32 miles per hour at Brownsville. The disturbance did not develop winds of more than moderate gale force.

VI. *The intense New England hurricane of September 8–16.*—The second most destructive hurricane in the history of the country struck inland over Long Island on September 14, took a toll of 390 lives (including marine casualties), and wrought property damage of over $100,000,000.

A complete report of this hurricane, in which listings of lowest pressures, highest winds, tides, fatalities, and property damage are tabulated and compared with like figures for the great New England hurricane of September 1938, can be found in the MONTHLY WEATHER REVIEW, September 1944; 72: 187–189.

VII. *Tropical disturbance of September 8–10.*— A partial wind circulation, evident early in the afternoon of September 7, developed and within the next 36 hours isobars with cyclonic curvature covered the entire west Gulf, and suggested a complete wind circulation with center near

latitude 23° N., longitude 94° W. First moving northward and turning to the northeastward during the 9th it reached the vicinity of Mobile late on the 10th, accompanied by heavy washing rains that continued for about 18 hours, and moderate to fresh, occasionally gusty, easterly winds.

At Mobile a low pressure of 29.63 inches (1,003.4 millibars) was reached at 2:45 p. m. on the 10th. At approximately the same time, the wind reached a maximum velocity of 18 miles per hour from the south with a few gusts reaching 30 miles per hour. Pensacola Naval Air Station reported a maximum wind velocity of 54 miles per hour.

High tides and heavy rains were responsible for practically all of the damage reported. High tide in the Mobile River, reached shortly before the computed time of low tide, was 3.8 feet above sea level, the highest tide since September 1, 1932. The heaviest 24-hour rainfall since 1937, 7.04 inches, was registered at Mobile. Other excessive 24-hour falls included 9.50 inches at Springhill, 10.15 inches at River Falls, and 11 inches at Bellingrath Gardens about 25 miles south of Mobile.

Streets in Mobile were flooded to depths ranging from 6 to 18 inches, and rain water backed into the lower floors of some homes in the southern section of the city. In this area small boats were used on some streets between 10 a. m. and 3 p. m. on the 10th. The bridge causeway was closed part of the afternoon when water to a depth of 1 foot washed over it. No fatalities or injuries resulting from the storm have been reported.

Reduction of various crops in Mobile and Baldwin counties as a result of flooding have been estimated as follows: corn 15 percent, soy beans 10 percent, hay 40 percent, peanut hay 30 percent, and fall potatoes 40 percent.

VIII. *Hurricane of September 19–21.*—Forming from a wave in the Caribbean Sea near the Yucatan Channel, this storm quickly developed a small center with winds of about hurricane force and moved into northern Yucatan on the 20th. Curving toward the southwest and passing south of Merida, it entered the Gulf of Mexico at Campeche about midnight of the 20th–21st. Traversing a small extent of the Gulf the center reentered Mexico between Coatzacoalcos and Ciudad del Carmen in the late afternoon of the 21st. Reports received from Yucatan and from aircraft indicate a very small center with winds of 75 miles per hour throughout the life of this storm.

Although no figured estimates of total damage in Mexico are available, it is known that floods and resultant landslides did extensive damage to transport and communication systems.

Press reports indicate that 200–300 persons drowned in floods that occurred in the Isthmus of Tehuanepec, and 2 or 3 crew members were lost in the sinking of a Mexican schooner of 150 tons off the coast of Campeche.

IX *Slight tropical disturbance of October 1–2.*—Developing from disturbed and squally conditions that had been noted east of the Lesser Antilles, during the several days previous, this disturbance moved northward near the 60th meridian into a strong trough that existed east of Bermuda. The storm did not develop hurricane winds and no reports of damage to shipping have been received.

X *The severe Florida-Cuba hurricane of October 13–21.*—A detailed report on this storm, which took a toll of over 300 lives and resulted in total property damage exceeding $100,000,000, is contained in the MONTHLY WEATHER REVIEW, November 1944; 72: 221–223.

Storm.—On November 2 at about 5:30 a. m. a vessel, involved in a storm near latitude 11° N., longitude 82° 36′ W., sent a report of a 60 knot wind from the west, pressure 29.60 inches (1,002.4 millibars), seas mountainous, and vessel laboring heavily. Similar conditions were reported for about 3 hours, during which time the vessel called for assistance. The storm dissipated or moved inland a short time later as aircraft reconnaissance early on the following day failed to locate any disturbance. Since it is impossible to trace a movement, from available reports, or to determine whether the ship was involved in a small hurricane or a very severe squall, this storm is carried as a matter of record, and it is not listed as a tropical disturbance of the past season.

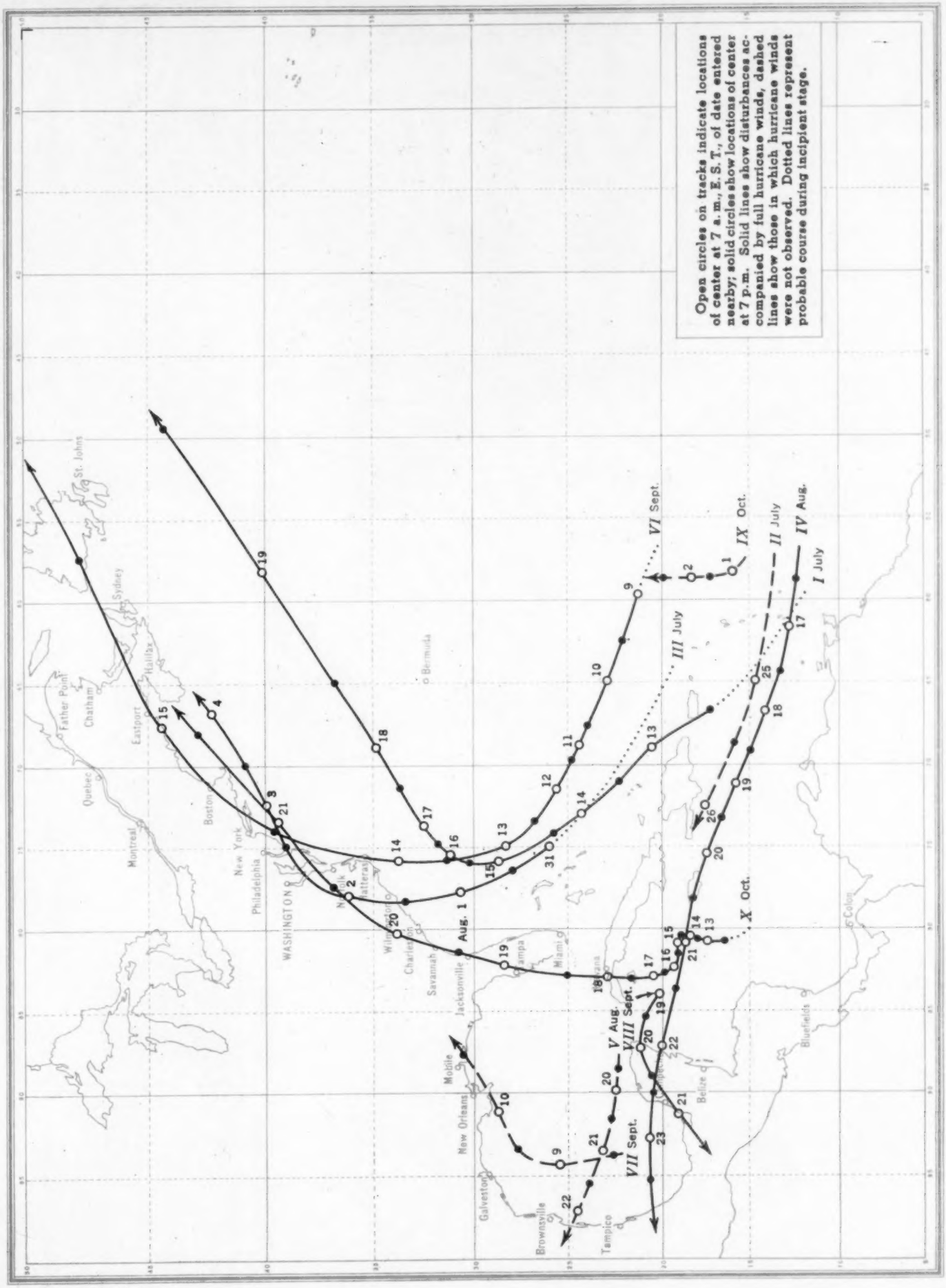
TABLE 1.—*North Atlantic hurricanes and tropical disturbances of 1944*

[Number of storm in table corresponds to number of path on accompanying chart]

Storm	Date	Place where first reported	Coast lines crossed	Maximum wind velocity reported [1]	Lowest pressure reported [2]	Place of dissipation	Intensity	Remarks
I	July 12–19	Near the Grenada Islands.	None	40 miles per hour reported at Bermuda.	No data [3]	North Atlantic southeast of Newfoundland.	Likely of hurricane intensity.	Presented a serious threat to the Atlantic coast until recurve to the northeastward began on the 16th. No strong winds occurred at any coastal station of the United States.
II	July 24–30	East of Martinique and Santa Lucia.	do	55 miles per hour at Fort de France, Martinique.	do	Western Haiti	Not of hurricane intensity.	Velocities probably about 60 miles per hour throughout the course of this storm. Considerable damage reported from the town of Jacmel on the south coast of Haiti.
III	July 30–Aug. 4	About 175 miles northeast of Nassau.	North Carolina, Virginia, Delaware, and New Jersey.	Estimated 70 to 80 miles per hour at the Oak Island Coast Guard Station, N. C.	989.5 millibars (29.22 inches) at Oak Island Coast Guard Station.	North Atlantic south of Nova Scotia.	Full hurricane	Damage in the Wilmington area estimated at $2,000,000. Several persons injured but no deaths reported.
IV	Aug. 16–23	East of Barbados, Windward Islands.	Jamaica, Yucatan and Veracruz, Mexico.	Estimated 100 to 120 mile gusts at Boston Bay, Jamaica.	973.3 millibars (28.74 inches); a ship at 15° 10′ N., 66° 40′ W.	East coast of Mexico south of Tuxpan.	do	Property damage estimated at several million dollars. Loss of life probably exceeded the 116 fatalities reported.
V	Aug. 20–22	North of Yucatan Peninsula.	Mexico	34 miles per hour at Port Isabel, Tex.	No data near center.	Northeast coast of Mexico a short distance south of Brownsville.	Not of hurricane intensity.	No damage or loss of life reported.
VI	Sept. 8–16	Near latitude 21° N., longitude 60° W.	New York, Connecticut, Rhode Island, Massachusetts, and Maine.	Estimated 90 miles per hour from the west at Hatteras, N. C.	947.2 millibars (27.97 inches) at Hatteras, N. C.	Merged with extratropical LOW in the North Atlantic Ocean southeast of Greenland.	Full hurricane	Listed as the second most destructive hurricane to reach the coast of the United States. Damage estimated in excess of $100,000,000. In the disastrous September hurricane of 1938 damage was placed at $250,000,000 to $350,000,000.
VII	Sept. 8–10	Southwest Gulf of Mexico.	Louisiana and Alabama.	54 miles per hour at Pensacola Naval Air Station.	1003.4 millibars (29.63 inches) at Mobile, Ala.	East of Mobile	Not of hurricane intensity.	Damage in the city of Mobile estimated at $10,000, mostly from high tides and heavy rains. No loss of life or injuries reported.
VIII	Sept. 19–21	Northwest Caribbean Sea.	Mexico	75 miles per hour at Campeche.	1,001 millibars (29.56 inches) at Campeche.	Isthmus of Tehuantepec.	Hurricane intensity.	Press reports list 200–300 persons drowned in the floods of the Isthmus o Tehuantepec.
IX	Oct. 1–2	Northeast of Barbados.	None	Beaufort force 7 (32–38 miles per hour) from the south, a ship.	1,004 millibars (29.65 inches), a ship.	Atlantic Ocean northeast of Leeward Islands.	Not of hurricane intensity.	No damage to shipping has been reported.
X	Oct. 13–21	About 100 miles east of Swan Island.	Cuba, Florida, Georgia, Virginia, Maryland, and Delaware.	120 miles per hour from the east at Dry Tortugas.[4]	948.9 millibars (28.02 inches) at Dry Torgutas.	Merged with the Icelandic LOW east of Greenland.	Full hurricane	Great destruction in Florida and Cuban area. Loss of life has been estimated at 318 and property damage at approximately $100,000,000.

[1] Velocities maintained for a period of 5 minutes, except when reported as gusts.
[2] Reduced to sea level.
[3] Restriction of radio reports has resulted in a scarcity of material on storms that expended their energy over water surfaces.
[4] Anemometer blown down by wind maintaining 120 miles per hour velocity.

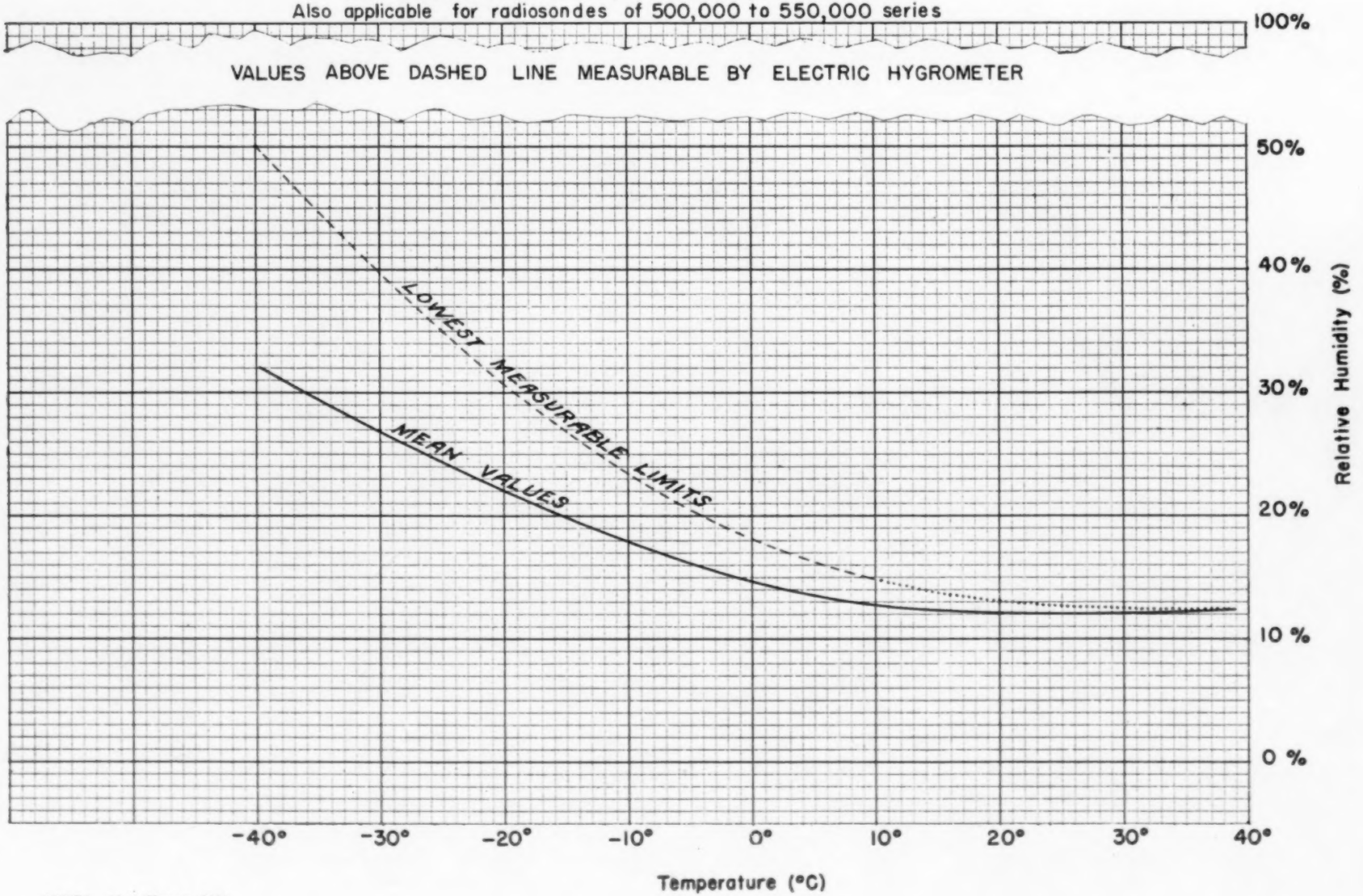
Chart I. Tracks of North Atlantic Hurricanes and Tropical Disturbances of 1944



DEPARTMENT OF COMMERCE, WEATHER BUREAU

MEAN VALUES OF RELATIVE HUMIDITY, WHICH EXIST AT VARIOUS TEMPERATURES, WHEN ELECTRIC HYGROMETER IS BELOW ITS OPERATING RANGE.

(For Radiosondes of 340,000 & 400,000 Series)
Also applicable for radiosondes of 500,000 to 550,000 series



METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR DECEMBER 1944

[Climate and Crop Weather Division, W. A. Mattice, Acting in charge]

AEROLOGICAL OBSERVATIONS

CURVE METHOD FOR OBTAINING MONTHLY MEANS OF RELATIVE HUMIDITY

THE resistance of the electric element used to measure relative humidity varies inversely with both temperature and relative humidity until, at low temperatures, the resistance becomes so high that it is virtually equivalent to on open circuit and so prevents recording of low humidities.

Thus, at upper and consequently colder levels, actual values are not available for low relative humidities. These measurable limits are indicated by a broken line on the graph accompanying this article; those values below the line not being measurable by the electric hygrometer. In order to prevent the monthly mean values from being biased upwards, due to absence of the low humidities, a system was devised and is now being used, for estimating the missing values and so obtaining monthly means which are approximately those which would result if all humidities were recorded.

A group of observations derived by means of the hair hygrometer was selected for use in preparation of this system. From these observations, humidity values which would not have been recorded if the electric hygrometer had been used (due to the limitations mentioned) were tabulated against their temperatures, which were divided into classes of 3 degrees. Means of over 2,500 of these values were used in preparation of the curve shown below. A copy of the tabulation used for the 500,000 to 550,000 series of radiosondes is also shown. The curve constructed from these data was similar to that in use for the 340,000 to 400,000 series of radiosondes and instructions accordingly provide for use of the same curve for both series of instruments. Data used were for various years and mainly for the months of January and July, using both day and night observations. Samples of data for other months were occasionally injected but showed no outstanding differences.

Whenever humidity values from the electric hygrometer are missing, due to these temperature-humidity limitations, values from the means curve are entered in their place on the monthly summary forms. For example, if the humidity value is lower than the measurable limit at a temperature of −20° a humidity value of 22 percent would be entered on Form 1109. Columns, representing standard levels must, however, have at least 16 recorded values, as distinuished from estimated values, in order to be summarized.

Since the humidity range of values below the measurable limits increases as the temperature decreases, the accuracy of the curve decreases accordingly. Therefore, only monthly mean humidity values having a corresponding monthly mean temperature of −20° or higher are published, in order to reduce the error.

Although curve values are not satisfactory for daily comparison, it is believed their use in preparation of monthly means will result in values within the 10 percent limit of tolerance required of the radiosondes, and in most cases measurements will be considerably closer.

TABULATION OF DELIMITED HUMIDITY VALUES

(For 500,000 to 550,000 series of radiosondes)

Relative Humidity

From—	To—	Bismarck		Charleston		Denver		El Paso		Fairbanks		Oakland		Portland		San Juan		Total		
		Number of observations	Sums	Number of observations	Sums	Number of observations	Sums	Number of observations	Sums	Number of observations	Sums	Number of observations	Sums	Number of observations	Sums	Number of observations	Sums	Number of observations	Sums	Means
°C.	°C.																			
10	12			1	12			1	13					3	18	1	9	6	52	8.7
7	9			3	38							7	78	9	104	3	26	22	246	11.2
4	6	1	12	4	56	1	17	1	17	1	15	8	99	13	155	9	130	38	501	13.2
1	3			6	83			2	28	1	11	7	84	16	182	18	242	50	630	12.6
0	−2	7	103	6	86	1	11	1	16	4	78	11	157	27	420	19	246	76	1,117	14.7
−3	−5	3	43	4	59	6	106	4	71	3	45	11	167	25	381	27	385	83	1,257	15.1
−6	−8	11	208	14	230	4	74	7	124	3	47	12	184	37	612	28	441	116	1,920	16.6
−9	−11	14	275	7	142	4	62	6	111	5	91	18	319	37	642	26	458	117	2,100	17.9
−12	−14	12	263	13	227	8	158	11	265	5	116	15	267	47	866	44	721	155	2,883	18.6
−15	−17	17	350	13	266	10	237	17	362	5	103	19	353	54	1,070	19	388	154	3,129	20.3
−18	−20	29	691	20	418	14	278	23	549	6	132	22	478	51	1,045	45	918	210	4,509	21.5
−21	−23	24	593	18	360	17	404	24	604	3	59	14	272	53	1,398	36	663	199	4,353	21.9
−24	−26	38	969	18	410	20	508	36	915	16	429	24	480	71	1,742	35	809	258	6,322	24.5
−27	−29	33	873	23	525	23	575	32	884	12	376	26	599	67	1,651	60	1,227	276	6,710	24.3
−30	−32	39	1,167	17	394	34	1,028	47	1,434	22	726	20	504	69	1,911	30	779	278	7,943	28.6
−33	−35	37	1,080	23	560	35	1,185	44	1,380	28	988	30	770	55	1,624	48	1,051	300	8,638	28.8
−36	−38	17	559	2	40	18	597	15	481	18	738	30	822	50	1,563	24	519	174	5,319	30.6
−39	−40	3	127			5	191	7	203	11	452	15	484	5	193	5	118	51	1,768	34.7

TABLE 1A.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during December 1944*

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

Altitude (meters) m. s. l.	Albany, N. Y. (86 m.)				Albuquerque, N. Mex. (1,620 m.)				Apalachicola, Fla. (5 m.)				Atlanta, Ga. (300 m.)				Big Spring, Tex. (774 m.)				Bismarck, N. Dak. (505 m.)				Boise, Idaho (868 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1,008	−4.6	75	31	840	3.2	53	22	1,021	11.0	86	30	987	4.3	74	31	932	4.2	73	28	959	−8.5	83	29	924	−2.1	88
500	31	956	−5.4	72					22	963	11.6	71	30	963	5.6	68												
1,000	31	897	−7.1	71					22	907	9.5	64	30	906	4.9	69	31	906	6.1	63	28	900	−8.1	74	29	909	−1.8	85
1,500	21	841	−8.5	67					22	854	7.7	51	30	852	4.4	60	31	853	6.2	54	28	843	−8.4	58	29	854	−1.3	75
2,000	31	788	−9.6	65	31	802	2.8	50	22	803	6.2	44	30	801	3.1	50	31	802	4.9	49	28	790	−9.2	48	29	801	−2.3	64
2,500	31	739	−10.1	63	31	754	0.3	49	22	755	4.6	....	29	753	1.1	47	31	754	2.4	44	28	740	−10.9	46	29	753	−3.4	55
3,000	31	692	−11.3	59	31	707	−2.4	48	22	710	2.4	....	28	708	−1.0	40	31	709	−0.1	40	28	694	−13.0	45	29	706	−5.2	48
4,000	31	607	−15.8	56	31	623	−8.2	48	22	627	−2.6	....	28	624	−6.3	39	31	625	−8.7	31	28	607	−19.1	51	29	621	−10.5	....
5,000	31	531	−21.8	62	31	547	−14.2	48	22	552	−8.5	....	28	548	−12.6	....	31	549	−12.1	....	28	530	−24.8	48	28	544	−17.3	....
6,000	31	463	−27.7	....	29	479	−21.2	....	21	484	−14.2	....	27	480	−18.9	....	31	481	−19.0	....	27	462	−31.7	....	28	476	−24.2	....
7,000	31	401	−34.8	....	29	417	−28.6	....	19	424	−20.5	....	26	418	−25.9	....	30	420	−26.5	....	26	400	−38.7	....	26	413	−32.3	....
8,000	31	347	−41.4	....	29	361	−35.9	....	18	369	−28.0	....	25	363	−32.9	....	29	364	−33.6	....	26	344	−45.6	....	25	358	−39.7	....
9,000	31	299	−49.5	....	29	312	−42.8	....	18	320	−35.0	....	25	314	−39.7	....	27	315	−40.6	....	25	295	−51.8	....	25	308	−47.3	....
10,000	30	257	−53.7	....	29	269	−49.4	....	18	277	−42.2	....	21	271	−46.3	....	26	272	−47.7	....	21	253	−55.9	....	23	265	−54.4	....
11,000	28	220	−57.3	....	26	230	−54.8	....	17	238	−49.5	....	18	234	−52.4	....	24	233	−54.4	....	17	217	−56.8	....	16	226	−60.2	....
12,000	21	187	−57.5	....	24	197	−58.0	....	14	203	−56.7	....	18	200	−57.5	....	21	199	−59.4	....	10	185	−56.1	....	11	191	−64.3	....
13,000	10	160	−55.0	....	17	168	−58.4	....	12	174	−61.1	....	11	170	−59.8	....	14	170	−61.9	....	7	159	−55.6	....	5	163	−62.1	....
14,000	5	135	−55.3	....	14	143	−59.4	....	8	147	−61.6	....	7	145	−59.5	....	12	144	−61.7	....								
15,000									5	124	−64.6	....					9	123	−63.6	....								

Altitude (meters) m. s. l.	Brownsville, Tex. (6 m.)				Buffalo, N. Y. (221 m.)				Caribou, Maine (193 m.)				Charleston, S. C. (14 m.)				Denver, Colo. (1,616 m.)				Dodge City, Kans. (787 m.)				El Paso, Tex. (1,195 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1,021	14.3	82	31	991	−3.3	77	30	992	−10.2	91	26	1,020	4.0	80	31	839	−3.0	69	31	929	−1.7	82	30	885	6.9	50
500	31	963	14.7	71	31	957	−4.0	75	30	953	−9.9	86	26	961	6.2	58												
1,000	31	908	12.2	66	31	898	−6.6	75	30	894	−11.3	79	26	904	4.7	55					31	904	0.4	68				
1,500	31	855	9.8	63	31	842	−8.7	72	30	837	−11.9	72	26	851	4.1	45					31	850	−0.1	61	30	854	8.2	45
2,000	31	805	8.2	54	31	789	−10.1	71	30	784	−13.0	70	26	799	2.4	41	31	800	0.6	47	31	798	0.1	50	30	802	5.6	44
2,500	31	757	6.6	44	31	739	−10.9	60	30	734	−14.3	67	26	751	0.3	....	31	751	−1.3	44	31	750	−1.4	40	30	755	3.0	43
3,000	31	712	4.0	40	31	693	−12.0	54	30	687	−16.3	64	26	706	−1.6	....	31	705	−4.2	45	31	704	−4.1	39	30	709	0.1	39
4,000	31	629	−1.6	31	30	637	−16.0	59	30	600	−20.6	58	25	622	−6.8	....	31	620	−10.9	46	31	619	−10.0	38	30	625	−5.6	....
5,000	31	554	−7.7	....	29	531	−21.6	....	29	524	−25.8	....	23	546	−13.0	....	31	544	−17.4	40	31	543	−16.6	....	30	550	−12.5	....
6,000	31	487	−13.9	....	29	463	−28.0	....	29	456	−32.1	....	21	479	−18.9	....	31	476	−24.4	42	31	475	−23.8	....	30	481	−19.6	....
7,000	31	426	−20.5	....	28	402	−35.1	....	28	395	−38.2	....	21	418	−25.6	....	30	413	−32.0	....	31	413	−31.0	....	30	420	−26.9	....
8,000	31	371	−27.4	....	26	347	−41.6	....	28	341	−44.6	....	18	362	−33.1	....	24	359	−39.2	....	31	358	−38.5	....	30	364	−34.0	....
9,000	31	322	−34.7	....	24	299	−47.7	....	27	294	−50.6	....	15	313	−40.4	....	21	309	−46.8	....	30	308	−45.9	....	30	315	−41.0	....
10,000	31	279	−42.1	....	21	257	−53.0	....	25	252	−55.4	....	10	269	−46.3	....	17	266	−53.5	....	27	264	−52.4	....	30	271	−47.7	....
11,000	28	240	−49.7	....	18	221	−56.5	....	16	217	−57.7	....	8	231	−51.2	....	10	228	−57.9	....	20	227	−57.2	....	29	233	−53.6	....
12,000	28	206	−56.2	....	11	189	−57.6	....	13	185	−56.8	....					5	197	−63.5	....	14	193	−58.6	....	27	199	−58.8	....
13,000	26	175	−60.9	....					8	159	−56.6	....									5	164	−57.3	....	16	169	−59.6	....
14,000	21	149	−64.0	....																					9	144	−60.1	....
15,000	13	126	−65.8	....																					6	122	−63.1	....
16,000	5	107	−69.4	....																								

Altitude (meters) m. s. l.	Ely, Nev. (1,908 m.)				Glasgow, Mont. (648 m.)				Grand Junction, Colo. (1,416 m.)				Great Falls, Mont. (1,128 m.)				Greensboro, N. C. (273 m.)				Hatteras, N. C. (3 m.)				Huntington, W. Va. (172 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	812	−5.6	81	31	944	−7.4	80	31	863	0.2	57	31	889	−2.1	57	25	988	−0.5	74	31	1,021	6.8	81	30	1,001	−1.1	82
500																	25	930	0.4	63	31	961	6.9	65	30	960	−0.8	80
1,000					31	903	−5.2	72									25	903	−0.3	58	31	904	4.2	59	30	902	−2.8	77
1,500					31	847	−5.4	62	31	855	0.9	55	31	850	−0.6	51	25	848	−0.5	51	31	850	2.7	55	30	847	−3.3	70
2,000	31	803	−3.8	74	31	794	−7.0	62	31	803	0.4	50	31	797	−3.3	51	25	796	−1.7	49	31	799	1.1	42	30	795	−4.0	64
2,500	31	754	−1.7	53	31	745	−9.2	61	31	754	−2.1	52	31	748	−6.1	53	25	747	−3.7	48	31	751	−0.9	40	30	746	−4.9	45
3,000	31	708	−3.8	48	31	698	−11.6	58	31	708	−4.6	52	31	701	−8.7	54	25	702	−5.7	....	31	705	−3.4	41	28	699	−7.4	....
4,000	31	623	−9.1	44	31	612	−17.0	50	31	623	−10.6	49	30	616	−13.3	45	25	617	−11.1	....	31	621	−8.2	....	28	614	−12.4	....
5,000	31	547	−15.4	41	30	535	−23.1	47	31	546	−16.6	....	28	540	−19.9	46	24	540	−17.5	....	31	545	−14.1	....	28	538	−18.3	....
6,000	30	478	−22.9	....	30	466	−29.6	....	30	477	−23.2	....	27	471	−27.1	....	24	472	−24.2	....	28	477	−20.3	....	28	470	−24.4	....
7,000	30	417	−30.8	....	29	404	−38.7	....	29	415	−30.8	....	27	409	−34.7	....	24	411	−31.2	....	28	416	−26.6	....	28	409	−30.8	....
8,000	30	361	−38.5	....	28	348	−43.9	....	26	360	−38.3	....	27	353	−42.6	....	24	356	−37.6	....	27	362	−33.1	....	26	354	−38.2	....
9,000	26	311	−46.2	....	26	300	−50.8	....	25	310	−45.9	....	25	304	−49.8	....	23	307	−43.5	....	26	313	−40.3	....	25	305	−44.7	....
10,000	25	267	−53.2	....	23	258	−56.1	....	20	267	−53.1	....	19	261	−55.1	....	21	264	−49.6	....	25	270	−47.2	....	24	262	−50.8	....
11,000	21	228	−59.5	....	18	221	−59.8	....	15	229	−57.5	....	15	224	−58.4	....	20	226	−54.7	....	23	232	−53.2	....	21	225	−54.8	....
12,000	6	194	−61.6	....	7	188	−55.8	....	11	195	−59.4	....	5	189	−58.7	....	14	193	−56.1	....	18	198	−57.9	....	16	191	−56.8	....
13,000									9	166	−59.1	....					10	164	−54.7	....	14	169	−59.1	....	8	162	−52.6	....
14,000																					6	143	−59.6	....	5	137	−51.1	....

TABLE 1A.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during December 1944*—Continued

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

Altitude (meters) m.s.l.	Int'l Falls, Minn. (343 m.)				Jackson, Miss. (97 m.)				Joliet, Ill. (178 m.)				Lake Charles, La. (5 m.)				Little Rock, Ark. (79 m.)				Louisville, Ky. (165 m.)				Mazatlan, Mexico (80 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	29	975	−10.9	85	25	1,010	5.0	77	30	999	−6.6	84	31	1,022	9.7	85	31	1,013	3.1	78	31	1,002	−1.2	76	29	1,006	21.1	80
500	29	953	−11.4	86	25	962	5.8	67	30	989	−6.4	81	31	963	10.4	73	31	962	2.6	72	31	990	−1.7	72	29	959	22.1	40
1,000	29	896	−11.8	84	25	905	4.6	62	30	900	−7.1	72	31	907	8.8	65	31	904	2.3	69	31	902	−2.7	63	29	905	19.8	32
1,500	29	839	−11.8	74	25	851	3.8	55	30	844	−6.9	59	31	854	7.1	52	31	850	3.0	54	31	848	−2.6	57	29	854	16.6	30
2,000	29	786	−12.3	62	25	800	2.5	49	30	791	−7.5	48	31	803	5.6	49	31	799	1.7	51	31	795	−3.4	47	29	804	13.1	31
2,500	29	736	−14.3	59	25	752	0.4	47	30	742	−8.9	47	31	756	3.7	42	31	750	−0.2	47	31	746	−4.8	45	29	758	9.8	33
3,000	29	688	−16.5	59	25	706	−1.6	...	30	695	−10.4	47	31	710	1.4	38	31	705	−2.5	43	31	700	−6.9	43	29	713	6.5	...
4,000	29	602	−21.5	57	23	622	−6.3	...	30	610	−15.2	53	31	627	−3.5	...	31	621	−8.0	47	31	615	−11.8	...	29	631	−0.1	...
5,000	28	525	−27.2	...	23	547	−12.2	...	29	534	−21.0	59	28	551	−9.8	...	31	545	−13.8	...	29	539	−18.0	...	29	556	−6.7	...
6,000	28	456	−33.8	...	22	480	−19.2	...	29	465	−27.6	...	27	483	−16.6	...	31	477	−20.4	...	28	471	−24.8	...	27	488	−13.1	...
7,000	28	394	−40.8	...	21	418	−26.4	...	29	404	−34.1	...	25	422	−23.2	...	30	416	−27.2	...	24	409	−31.8	...	27	427	−20.3	...
8,000	24	340	−47.2	...	21	363	−33.2	...	29	350	−41.4	...	25	367	−30.2	...	30	361	−34.4	...	24	354	−39.2	...	23	373	−26.1	...
9,000	22	292	−51.8	...	21	314	−40.1	...	28	301	−48.2	...	25	318	−37.3	...	29	312	−41.2	...	22	306	−45.1	...	23	323	−36.0	...
10,000	19	249	−55.4	...	21	271	−47.1	...	27	258	−53.5	...	24	275	−44.8	...	27	270	−47.9	...	20	263	−50.2	...	23	280	−43.6	...
11,000	14	213	−55.3	...	20	232	−53.6	...	16	221	−57.1	...	22	236	−51.6	...	26	231	−54.6	...	18	225	−54.3	...	20	241	−51.3	...
12,000	12	182	−54.5	...	17	199	−57.3	...	11	189	−57.2	...	17	202	−56.8	...	22	198	−59.8	...	17	192	−57.9	...	19	206	−58.3	...
13,000	9	156	−53.7	...	10	169	−58.4	...	5	161	−56.9	...	12	172	−59.3	...	20	169	−62.8	...	6	163	−58.2	...	9	176	−62.2	...
14,000	5	134	−53.7	...	8	145	−61.5	...	...	...	...	...	10	146	−61.6	...	12	143	−62.2	...	...	...	...	...	...	...	...	...
15,000	...	...	...	...	...	...	...	...	...	...	...	...	9	125	−63.3	...	6	123	−64.0	...	...	...	...	...	...	...	...	...
16,000	...	...	...	...	...	...	...	...	...	...	...	...	5	105	−63.9	...	...	...	...	...	...	...	...	...	...	...	...	...

Altitude (meters) m.s.l.	Medford, Oreg. (409 m.)				Merida, Mexico (27 m.)				Miami, Fla. (4 m.)				Nashville, Tenn. (180 m.)				Oakland, Calif. (2 m.)				Ogden, Utah (1,355 m.)				Oklahoma City, Okla. (391 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	29	972	4.5	85	29	1,016	21.9	74	31	1,021	16.5	81	31	1,001	1.7	81	31	1,020	10.7	76	31	870	−2.1	82	31	975	2.2	77
500	29	962	5.1	82	29	962	19.7	70	31	964	16.2	75	31	962	0.9	77	31	960	10.9	61	...	...	...	...	31	962	2.7	74
1,000	29	905	6.1	67	28	908	16.1	75	31	909	12.8	75	31	904	0.0	69	31	905	9.1	57	...	...	...	...	31	905	2.7	63
1,500	29	852	4.6	60	28	856	12.9	77	31	856	10.1	70	31	850	0.1	59	31	851	6.6	53	31	854	−0.6	72	30	851	2.9	61
2,000	29	800	2.2	58	28	806	10.2	71	31	806	8.1	58	31	798	−0.9	59	31	801	3.8	51	31	803	−1.8	63	30	800	2.1	54
2,500	29	752	−0.4	56	28	759	9.2	47	31	758	7.9	33	31	749	−3.1	58	31	753	0.9	51	31	754	−3.8	62	30	752	0.4	47
3,000	29	706	−3.5	55	28	714	7.9	...	31	714	5.8	...	31	703	−5.1	53	31	707	−2.3	52	31	707	−6.0	53	30	706	−2.1	42
4,000	27	621	−10.1	54	24	632	3.3	...	31	631	0.6	...	28	618	−10.1	43	31	622	−8.5	43	31	622	−11.2	49	30	622	−7.9	44
5,000	27	545	−16.7	58	24	558	−2.7	...	31	556	−4.9	...	27	542	−16.5	48	31	547	−14.7	47	31	545	−17.1	43	30	546	−14.3	46
6,000	26	476	−23.5	53	21	491	−9.5	...	31	489	−11.4	...	25	474	−22.8	...	31	478	−21.5	47	31	476	−24.1	42	30	478	−21.1	...
7,000	24	414	−31.4	...	19	431	−16.0	...	31	428	−18.3	...	25	412	−29.9	...	31	417	−28.9	...	30	414	−31.3	...	29	416	−27.6	...
8,000	24	358	−38.7	...	17	376	−24.0	...	31	374	−25.4	...	23	357	−37.3	...	30	361	−36.5	...	30	359	−39.1	...	29	361	−35.6	...
9,000	21	309	−46.2	...	17	327	−31.9	...	28	324	−33.2	...	22	309	−43.5	...	30	312	−43.7	...	30	309	−46.8	...	27	312	−42.5	...
10,000	21	265	−53.6	...	17	284	−39.8	...	26	281	−40.8	...	21	266	−49.8	...	28	268	−50.6	...	30	266	−53.8	...	27	269	−49.5	...
11,000	17	226	−59.3	...	16	244	−48.1	...	25	242	−48.3	...	19	228	−53.4	...	25	230	−56.7	...	30	227	−59.8	...	24	231	−55.6	...
12,000	13	192	−61.5	...	15	209	−55.9	...	22	208	−55.2	...	11	195	−58.5	...	21	196	−60.3	...	30	193	−62.1	...	21	197	−60.7	...
13,000	8	162	−58.2	...	14	179	−61.6	...	16	177	−60.5	...	8	166	−61.4	...	18	166	−59.4	...	26	164	−61.6	...	18	167	−61.8	...
14,000	7	138	−57.4	...	7	151	−65.7	...	9	151	−64.3	...	...	...	...	...	14	142	−58.2	...	22	140	−60.1	...	6	142	−61.5	...
15,000	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8	120	−57.8	...	14	118	−59.2	...	...	...	...	...
16,000	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	101	−59.5	...	...	...	...	...
17,000	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	86	−60.0	...	...	...	...	...

Altitude (meters) m.s.l.	Omaha, Nebr. (308 m.)				Phoenix, Ariz. (339 m.)				Pittsburgh, Pa. (362 m.)				Portland, Maine (20 m.)				Rapid City, S. Dak. (961 m.)				St. Louis, Mo. (171 m.)				St. Paul, Minn. (225 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	30	986	−3.7	79	31	979	9.5	63	31	974	−2.5	82	31	1,015	−5.2	78	31	906	−4.7	71	30	1,002	−2.2	75	31	993	−6.7	78
500	30	962	−4.4	77	31	960	13.8	45	31	960	−2.6	81	31	955	−4.5	68	...	...	...	...	30	962	−3.3	73	31	959	−8.3	79
1,000	30	902	−5.1	69	31	905	12.2	39	31	901	−4.4	80	31	896	−6.7	68	31	904	−4.3	69	30	903	−3.4	64	31	899	−9.4	76
1,500	30	847	−4.8	63	31	852	9.0	39	31	845	−6.0	70	31	840	−7.8	60	31	849	−2.4	55	30	848	−2.0	52	31	843	−9.6	70
2,000	30	794	−5.0	61	31	802	5.7	41	31	792	−6.6	61	31	788	−8.8	56	31	797	−4.9	56	30	796	−3.3	53	31	790	−9.6	57
2,500	30	745	−6.4	62	30	754	2.8	39	31	744	−7.5	56	31	738	−9.9	55	31	747	−7.0	53	30	747	−4.8	51	30	740	−11.1	52
3,000	30	699	−8.3	61	30	709	−0.4	36	31	697	−8.9	57	31	692	−11.5	60	31	700	−9.6	52	30	700	−7.1	47	30	693	−13.0	49
4,000	29	614	−13.1	56	30	625	−6.1	...	30	612	−13.7	55	31	607	−16.1	62	31	614	−14.5	45	30	616	−12.1	43	30	607	−17.8	52
5,000	28	538	−18.7	...	30	549	−13.2	...	30	536	−19.5	57	31	531	−21.7	60	31	538	−21.0	45	30	540	−18.0	48	30	530	−24.0	55
6,000	28	470	−25.0	...	30	481	−20.9	...	30	467	−25.7	...	30	463	−28.5	...	31	469	−27.8	...	30	471	−24.9	...	30	462	−30.5	...
7,000	28	408	−32.5	...	29	419	−28.3	...	29	406	−32.5	...	29	401	−34.9	...	31	407	−35.1	...	29	409	−32.4	...	29	400	−37.6	...
8,000	23	353	−40.1	...	29	363	−35.7	...	28	351	−39.0	...	29	347	−41.5	...	31	351	−42.2	...	29	354	−39.4	...	29	345	−44.3	...
9,000	20	304	−46.9	...	29	313	−42.8	...	27	303	−45.3	...	27	299	−47.3	...	30	303	−48.9	...	28	306	−46.1	...	28	296	−50.5	...
10,000	18	260	−52.5	...	27	270	−49.9	...	24	260	−50.2	...	24	257	−52.4	...	29	259	−54.7	...	21	262	−52.1	...	26	254	−55.1	...
11,000	17	223	−57.0	...	19	232	−55.6	...	21	224	−54.9	...	20	221	−55.7	...	25	222	−58.6	...	19	224	−56.8	...	20	218	−56.8	...
12,000	11	191	−58.5	...	12	198	−60.0	...	13	190	−58.2	...	15	188	−55.3	...	16	188	−57.6	...	15	191	−59.1	...	19	186	−56.7	...
13,000	...	...	...	...	...	...	...	...	9	161	−57.4	...	11	159	−52.3	...	7	160	−55.7	...	8	163	−58.8	...	14	189	−55.8	...
14,000	...	...	...	...	...	...	...	...	5	138	−58.6	...	5	136	−50.7	...	...	...	...	...	5	138	−58.8	...	6	136	−54.4	...

TABLE 1A.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during December 1944*—Continued

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

Altitude (meters) m.s.l.	San Antonio, Tex. (240 m.)				San Juan, P. R. (15 m.)				Santa Maria, Calif. (71 m.)				S. Ste. Marie, Mich. (221 m.)				Spokane, Wash. (598 m.)				Swan Island, West Indies (10 m.)				Tacubaya, Mexico (2,306 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	994	8.3	81	28	1,014	24.7	75	31	1,011	10.3	82	31	990	−7.3	89	30	953	−1.8	87	30	1,016	24.2	77	31	775	12.7	50
500	31	963	10.2	71	28	958	20.9	76	31	960	13.3	55	31	955	−7.9	90					30	960	20.7	79				
1,000	31	907	9.1	73	28	904	17.2	78	31	905	11.1	44	31	896	−10.0	86	30	907	−3.0	86	30	906	17.5	77				
1,500	31	854	7.8	68	28	854	13.8	78	31	852	8.0	42	31	839	−11.5	73	30	851	−3.7	77	30	855	14.4	75				
2,000	31	804	6.0	56	28	804	11.5	63	31	801	4.9	46	31	786	−13.4	76	30	799	−3.9	65	30	806	12.1	71				
2,500	31	756	4.1	50	28	757	10.5		31	754	2.1	47	31	736	−14.6	70	30	749	−5.1	55	30	759	10.3	56	31	757	12.1	47
3,000	31	710	1.6	45	28	713	8.7		30	708	−0.9	43	31	688	−16.4	63	30	703	−7.2	54	30	714	8.6	42	31	713	9.1	48
4,000	31	667	−3.5		27	631	3.8		29	624	−7.5	41	31	602	−21.2	64	29	618	−12.4	53	30	632	4.2	27	31	631	1.2	62
5,000	31	552	−9.7		24	557	−2.0		29	548	−13.9	44	31	525	−27.0		29	541	−18.9		30	559	−1.7		31	557	−4.7	42
6,000	31	484	−16.3		21	490	−8.7		29	479	−21.3	42	31	457	−33.0		27	473	−26.2		29	492	−7.7		31	489	−10.9	33
7,000	31	423	−23.0		19	430	−15.5		29	418	−28.9		31	395	−39.3		27	411	−33.2		29	432	−14.7		31	429	−17.2	
8,000	31	368	−30.0		18	376	−21.5		26	362	−36.6		30	341	−45.3		27	355	−40.8		28	378	−22.0		30	374	−24.6	
9,000	31	319	−37.1		18	327	−30.2		26	312	−44.3		27	294	−50.8		25	307	−47.6		26	329	−29.5		30	325	−32.6	
10,000	31	276	−44.1		17	284	−37.5		24	268	−52.0		26	252	−54.8		24	263	−54.6		25	285	−37.4		30	282	−40.6	
11,000	30	237	−51.4		17	244	−44.8		19	230	−57.0		21	216	−55.6		15	225	−58.8		25	246	−45.5		30	243	−48.8	
12,000	27	203	−57.6		13	211	−51.0		10	195	−58.3		18	183	−54.9		6	194	−61.1		24	212	−52.7		25	208	−56.2	
13,000	25	173	−61.8		11	180	−58.0		5	166	−56.9		8	156	−53.0						24	181	−58.8		14	177	−62.1	
14,000	18	146	−62.8		10	153	−63.8						5	132	−52.6						15	154	−63.7					
15,000	13	124	−64.3																		10	131	−67.8					
16,000	7	107	−65.9																									
17,000	6	90	−67.7																									
18,000	5	77	−67.1																									

Altitude (meters) m. s. l.	Tampa, Fla. (3 m.)				Tatoosh Island, Wash. (31 m.)				Toledo, Ohio (191 m.)				Washington, D. C. (25 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1,023	13.2	80	31	1,015	7.1	74	30	997	−5.2	83	31	1,018	1.3	66
500	31	964	13.1	68	31	959	7.1	61	30	959	−5.2	81	31	959	−0.5	66
1,000	31	909	10.7	63	31	902	4.9	60	30	900	−6.2	71	31	901	−1.7	68
1,500	31	856	8.5	54	31	849	2.7	60	30	844	−7.2	67	31	847	−3.0	65
2,000	31	805	7.1	42	31	797	0.3	56	30	791	−8.7	62	31	794	−3.5	58
2,500	31	757	5.6		31	749	−2.2	49	30	742	−9.5	56	31	746	−5.0	53
3,000	31	712	3.7		31	703	−4.8	42	30	695	−10.8	52	31	699	−7.2	51
4,000	31	629	−1.1		31	618	−11.1	44	30	610	−15.5	56	30	615	−12.1	48
5,000	31	554	−6.9		31	542	−17.5	44	30	534	−21.2	62	30	539	−18.4	54
6,000	31	486	−12.8		30	473	−24.5		30	466	−27.5		29	471	−25.1	
7,000	30	426	−19.0		29	412	−32.1		30	404	−34.4		29	409	−32.1	
8,000	28	372	−26.7		28	356	−39.9		30	349	−41.1		29	354	−38.7	
9,000	28	323	−34.0		25	307	−47.3		28	300	−47.1		29	305	−44.9	
10,000	26	279	−41.6		20	266	−53.7		24	258	−52.2		29	225	−50.8	
11,000	24	241	−49.0		17	228	−60.5		21	222	−55.7		26	226	−55.3	
12,000	23	206	−56.0		11	195	−63.1		19	190	−57.8		20	191	−56.3	
13,000	20	176	−61.2		6	164	−62.4		11	162	−56.2		17	163	−56.9	
14,000	10	150	−64.8						7	137	−56.4		10	139	−56.5	
15,000									5	118	−56.9		7	119	−56.9	

NOTE.—All observations taken near 11 p. m., E. S. T. except at Mazatlan and Merida where they are taken near 9 p. m.

"Number of observations" refers to pressure only, as temperature and humidity data are sometimes missing for some observations at certain levels. Relative humidity data are not used in daily observations when the temperature is below −20.0° C.

None of the means included in these tables are based on less than 15 surface or 5 standard level observations.

All relative humidity observations are obtained by means of the electric hygrometer and have been adjusted to compensate for the values occurring below the operating range of the humidity element. See article entitled "Curve Method for Obtaining Monthly Means of Relative Humidity" in this issue.

TABLE 1B.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during the year 1944*

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

Altitude (meters) m. s. l.	Albany, N. Y. (86 m.)				Albuquerque, N. Mex. (1,620 m.)				Apalachicola, Fla. (5 m.)				Atlanta, Ga. (300 m.)				Big Spring, Tex. (774 m.)				Bismarck, N. Dak. (505 m.)				Boise, Idaho (866 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	363	1,006	6.9	78	352	837	13.5	43	356	1,018	19.5	84	357	984	15.3	74	363	927	17.2	55	360	955	5.1	76	355	916	11.3	58
500	363	957	6.9	69	----	----	----	----	356	961	18.7	68	357	961	15.8	66	----	----	----	----	----	----	----	----	----	----	----	----
1,000	363	900	4.7	69	----	----	----	----	356	907	16.1	62	357	906	13.6	65	363	903	17.5	50	360	900	5.4	67	355	902	11.6	51
1,500	363	847	2.5	67	----	----	----	----	356	855	13.6	56	357	854	11.2	61	363	851	15.0	47	360	846	3.7	64	355	850	9.2	47
2,000	363	795	0.4	65	352	800	12.0	40	356	805	10.5	50	357	804	9.0	57	363	802	12.2	45	360	795	1.5	60	355	799	5.8	48
2,500	362	747	−1.7	61	352	753	8.8	42	356	758	8.8	47	354	756	6.5	53	363	755	9.2	42	360	747	−1.0	56	355	751	2.4	51
3,000	362	701	−3.4	56	352	709	5.1	44	356	713	6.2	43	351	711	3.8	50	363	711	5.8	41	360	701	−3.7	54	355	706	−0.9	52
4,000	359	617	−8.9	47	352	626	−2.4	51	354	631	0.8	39	339	628	−1.7	45	362	628	−0.8	38	355	617	−9.6	51	354	622	−7.6	55
5,000	357	542	−14.6	43	351	551	−9.6	53	352	556	−5.0	----	335	553	−7.5	----	358	554	−7.4	38	347	542	−15.6	47	346	546	−14.3	54
6,000	355	474	−21.1	----	341	483	−16.6	43	349	489	−11.3	----	327	486	−13.7	----	356	486	−13.9	----	341	474	−22.3	47	342	478	−21.1	48
7,000	350	413	−28.0	----	339	423	−23.2	----	346	429	−18.0	----	316	425	−20.6	----	354	425	−21.0	----	329	413	−29.4	----	335	417	−28.3	----
8,000	349	359	−35.0	----	321	367	−30.6	----	344	374	−25.2	----	299	371	−27.7	----	352	370	−28.3	----	310	358	−36.7	----	323	362	−35.5	----
9,000	344	310	−41.9	----	299	318	−37.7	----	342	325	−32.5	----	282	322	−35.1	----	346	321	−35.6	----	279	309	−43.7	----	309	312	−42.7	----
10,000	337	267	−47.8	----	270	275	−44.4	----	338	282	−40.1	----	255	279	−42.2	----	334	278	−43.0	----	238	267	−49.4	----	275	269	−49.0	----
11,000	315	229	−52.1	----	242	237	−50.4	----	315	243	−47.5	----	230	240	−49.2	----	299	239	−50.1	----	----	----	----	----	233	231	−53.4	----
12,000	273	196	−54.9	----	----	----	----	----	262	208	−54.0	----	195	206	−55.0	----	259	205	−55.6	----	----	----	----	----	206	198	−55.3	----
13,000	213	168	−56.2	----	----	----	----	----	196	178	−59.5	----	148	176	−59.0	----	----	----	----	----	----	----	----	----	148	169	−55.6	----
14,000	163	144	−57.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

	Brownsville, Tex. (6 m.)				Buffalo, N. Y. (221 m.)				Caribou, Maine[1] (193 m.)				Charleston, S. C. (14 m.)				Denver, Colo. (1,616 m.)				Dodge City, Kans. (787 m.)				El Paso, Tex. (1,195 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	365	1,014	21.6	85	356	991	7.7	78	324	992	2.9	81	350	1,017	15.8	68	362	837	8.7	56	360	925	10.9	75	359	881	17.4	41
500	365	958	19.7	78	356	958	7.5	70	324	955	3.3	73	350	960	16.5	72	----	----	----	----	----	----	----	----	----	----	----	----
1,000	365	904	17.6	64	356	901	5.2	68	324	898	1.3	71	350	906	14.2	67	----	----	----	----	360	902	12.2	63	----	----	----	----
1,500	365	853	15.6	54	356	847	2.7	67	324	843	−0.7	68	350	853	11.8	62	----	----	----	----	360	849	10.7	55	359	851	17.4	37
2,000	365	804	13.6	45	356	796	0.5	64	324	792	−2.6	65	350	803	9.4	58	362	799	9.6	45	360	799	8.7	50	359	802	14.0	37
2,500	365	757	11.1	40	356	748	−1.8	59	324	743	−4.8	60	350	756	7.0	55	362	752	6.4	45	359	752	5.9	47	359	755	10.4	40
3,000	365	713	8.4	37	356	702	−4.0	55	324	697	−7.0	56	350	711	4.6	52	362	707	2.8	48	359	707	2.8	45	359	711	6.7	42
4,000	362	631	2.1	35	350	618	−9.2	50	324	613	−12.1	48	339	629	−0.9	48	361	624	−4.6	54	358	624	−3.9	43	359	628	0.4	46
5,000	361	557	−4.3	34	348	542	−14.9	44	322	537	−17.9	44	324	554	−6.8	49	361	550	−11.9	57	357	549	−10.7	36	359	554	−7.4	46
6,000	358	490	−10.9	32	346	474	−21.3	41	322	469	−24.4	----	318	487	−13.1	46	360	481	−19.0	53	350	481	−17.4	33	358	486	−14.0	41
7,000	354	429	−17.5	----	343	413	−28.2	----	315	406	−31.1	----	308	426	−19.7	----	355	420	−20.3	----	354	420	−24.4	----	357	429	−20.9	----
8,000	350	375	−24.7	----	329	359	−34.9	----	305	353	−37.9	----	290	372	−26.8	----	335	364	−33.6	----	350	366	−31.7	----	358	371	−28.0	----
9,000	347	325	−32.1	----	310	310	−41.4	----	294	305	−44.1	----	272	323	−34.1	----	309	315	−40.9	----	334	317	−39.0	----	347	321	−35.4	----
10,000	341	282	−39.6	----	284	268	−46.9	----	282	263	−48.9	----	247	280	−41.2	----	266	272	−47.2	----	313	273	−46.1	----	322	278	−42.6	----
11,000	329	243	−47.1	----	264	230	−51.3	----	248	225	−51.9	----	201	241	−48.1	----	219	234	−51.7	----	293	235	−52.0	----	278	240	−49.4	----
12,000	294	209	−53.9	----	228	197	−54.3	----	211	193	−53.2	----	----	----	----	----	170	200	−55.0	----	264	201	−55.5	----	239	206	−54.5	----
13,000	243	179	−59.3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	227	171	−57.6	----	----	----	----	----

	Ely, Nev. (1,908 m.)				Glasgow, Mont. (648 m.)				Great Falls, Mont. (1,128 m.)				Greensboro, N. C. (273 m.)				Hatteras, N. C. (3 m.)				Huntington, W. Va. (172 m.)				Int'l Falls, Minn. (343 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	360	808	6.3	55	366	939	6.7	67	364	885	8.1	54	346	986	12.1	79	353	1,018	15.9	84	359	998	10.7	82	361	974	3.7	77
500	----	----	----	----	----	----	----	----	----	----	----	----	346	960	13.2	67	353	960	14.7	69	359	959	12.1	68	361	956	4.2	71
1,000	----	----	----	----	366	900	7.1	60	----	----	----	----	346	905	11.0	63	353	905	12.1	63	359	904	9.6	65	361	899	2.0	70
1,500	----	----	----	----	366	847	4.9	57	364	847	7.5	48	346	852	8.4	62	353	853	9.7	58	359	851	6.9	64	361	845	0.3	66
2,000	360	800	7.4	53	366	796	2.1	59	364	797	4.2	51	346	801	6.0	60	353	802	7.3	51	359	800	4.4	62	361	793	−1.6	63
2,500	360	752	6.1	49	366	748	−0.9	60	364	749	0.8	55	345	754	3.7	53	353	755	5.0	47	357	752	2.2	56	361	745	−3.8	57
3,000	360	707	2.7	48	366	702	−3.9	59	364	703	−2.6	53	345	709	1.2	47	353	710	2.6	44	353	707	−0.3	51	361	699	−6.2	55
4,000	360	624	−4.4	47	366	618	−9.9	56	361	619	−9.0	58	339	625	−4.3	42	347	626	−2.9	40	349	623	−5.6	44	359	614	−11.5	50
5,000	360	549	−11.6	46	362	542	−16.1	50	356	543	−15.6	53	336	550	−10.1	----	339	551	−8.7	----	344	548	−11.4	40	356	538	−17.5	45
6,000	350	481	−18.7	46	359	474	−22.8	50	352	475	−22.6	50	336	482	−16.4	----	330	484	−14.9	----	339	480	−17.7	41	352	470	−24.2	----
7,000	342	420	−26.1	43	355	412	−30.0	----	347	414	−29.9	----	335	422	−23.3	----	306	424	−21.5	----	335	419	−24.4	----	344	409	−31.1	----
8,000	330	365	−33.6	----	353	357	−37.5	----	338	359	−37.3	----	329	367	−30.3	----	309	369	−28.5	----	329	365	−31.3	----	321	355	−38.0	----
9,000	312	315	−40.8	----	348	308	−44.7	----	322	310	−44.6	----	321	318	−37.5	----	301	320	−36.0	----	324	316	−38.2	----	289	306	−44.3	----
10,000	297	272	−47.6	----	337	265	−50.7	----	302	266	−50.7	----	312	275	−44.8	----	291	277	−43.4	----	320	273	−45.0	----	261	263	−49.7	----
11,000	271	234	−53.1	----	307	228	−54.7	----	282	229	−54.4	----	287	236	−51.4	----	270	238	−50.5	----	299	235	−51.1	----	244	226	−52.7	----
12,000	232	200	−56.4	----	248	195	−55.1	----	199	195	−55.1	----	268	202	−56.6	----	228	204	−56.4	----	264	201	−55.3	----	195	194	−54.0	----
13,000	192	171	−58.2	----	179	167	−54.5	----	----	----	----	----	240	172	−59.7	----	----	----	----	----	221	171	−57.6	----	----	----	----	----
14,000	146	146	−59.5	----	----	----	----	----	----	----	----	----	177	148	−62.5	----	----	----	----	----	----	----	----	----	----	----	----	----
15,000	89	124	−62.4	----	----	----	----	----	----	----	----	----	111	126	−64.3	----	----	----	----	----	----	----	----	----	----	----	----	----

	Joliet, Ill. (178 m.)				Lake Charles, La. (5 m.)				Little Rock, Ark. (79 m.)				Louisville, Ky. (166 m.)				Mazatlan, Mexico[2] (80 m.)				Medford, Oreg. (409 m.)				Miami, Fla. (4 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	360	996	8.3	82	366	1,017	18.8	85	364	1,008	15.9	75	365	998	12.6	73	295	1,004	23.4	80	363	968	13.8	60	366	1,018	22.1	84
500	360	958	9.4	71	366	960	18.2	71	364	959	15.9	63	365	959	12.9	64	295	957	22.4	58	363	958	13.8	59	366	961	20.5	81
1,000	360	902	7.1	68	366	905	15.8	65	364	904	13.4	63	365	904	10.2	63	295	904	21.0	49	363	903	11.6	56	366	907	17.4	78
1,500	359	848	5.1	64	366	854	13.5	57	364	852	11.1	59	365	851	7.7	62	295	853	18.3	48	363	850	8.4	58	365	856	14.7	73
2,000	359	797	3.0	57	366	804	11.3	51	364	802	8.8	54	365	800	5.5	56	295	804	15.5	45	363	800	5.0	60	365	806	12.4	64
2,500	359	750	0.7	52	365	757	8.8	46	364	755	6.4	50	365	753	3.1	51	295	758	12.7	44	363	752	2.0	60	364	759	10.3	55
3,000	359	704	−1.6	48	364	713	6.3	41	363	710	3.7	46	365	708	0.6	46	295	714	9.7	----	362	706	−0.8	57	364	715	7.9	52
4,000	357	620	−7.1	44	364	630	0.6	37	358	627	−2.2	41	360	624	−4.9	39	280	632	3.1	----	357	623	−6.6	51	360	633	2.6	46
5,000	351	545	−13.1	45	360	556	−5.6	34	354	552	−8.3	39	358	549	−10.7	33	265	558	−8.3	----	354	547	−12.9	49	356	558	−3.1	44
6,000	348	477	−19.4	43	358	488	−12.0	35	352	485	−14.7	----	354	481	−17.1	----	254	491	−9.9	----	349	479	−19.5	46	354	491	−9.2	----
7,000	345	416	−26.3	----	353	428	−18.9	----	350	424	−21.6	----	343	421	−23.5	----	248	431	−16.7	----	339	418	−26.7	43	352	431	−16.0	----
8,000	335	362	−33.4	----	352	373	−26.0	----	348	369	−28.7	----	335	366	−31.0	----	232	376	−23.5	----	329	363	−34.2	----	349	377	−23.0	----
9,000	324	313	−40.3	----	349	324	−33.3	----	340	320	−36.0	----	310	317	−37.8	----	226	327	−31.2	----	321	314	−41.4	----	345	328	−30.4	----
10,000	304	271	−46.6	----	343	280	−40.7	----	316	277	−43.1	----	267	275	−44.1	----	215	284	−38.8	----	301	270	−48.1	----	332	284	−37.9	----
11,000	272	233	−51.8	----	324	242	−47.9	----	275	239	−49.6	----	----	----	----	----	175	245	−46.1	----	279	232	−53.4	----	323	245	−45.5	----
12,000	239	200	−54.7	----	304	207	−54.3	----	----	----	----	----	----	----	----	----	144	211	−53.2	----	243	198	−56.4	----	300	211	−52.8	----
13,000	192	171	−56.5	----	262	177	−58.9	----	----	----	----	----	----	----	----	----	----	----	----	----	207	169	−56.9	----	264	180	−58.7	----
14,000	----	----	----	----	217	151	−62.8	----	----	----	----	----	----	----	----	----	----	----	----	----	149	145	−56.9	----	206	153	−63.7	----
15,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	116	131	−67.3	----

See footnotes at end of table.

TABLE 1B.—*Mean free-air barometric pressure in millibars, temperature in degrees centigrade, and relative humidities in percent, obtained by radiosondes during the year 1944*—Continued

STATIONS AND ELEVATIONS IN METERS ABOVE SEA LEVEL

Altitude (meters) m.s.l.	Nashville, Tenn. (180 m.)				Oakland, Calif. (2 m.)				Ogden, Utah (1,355 m.)				Oklahoma City, Okla. (391 m.)				Omaha, Nebr. (308 m.)				Phoenix, Ariz. (339 m.)				Pittsburgh, Pa. (382 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	363	997	14.8	71	366	1,016	13.5	75	366	864	9.0	60	357	970	14.8	73	358	981	10.6	76	366	973	20.2	46	364	971	10.1	73
500	363	960	14.4	63	366	957	13.0	62					357	957	15.5	66	358	958	10.3	71	366	934	22.8	32	364	957	10.2	70
1,000	363	905	11.7	62	366	902	12.6	48					357	903	13.9	59	357	902	8.4	67	366	901	19.9	30	364	903	8.2	67
1,500	363	852	9.4	59	366	850	10.3	42	366	849	10.1	51	355	851	12.0	55	357	849	6.6	63	366	850	16.0	33	364	850	5.6	65
2,000	363	802	7.2	54	366	800	7.5	38	366	799	7.6	46	354	801	8.9	50	357	798	4.8	58	366	801	12.1	37	364	799	3.1	63
2,500	363	754	4.7	52	366	752	4.7	34	366	752	4.0	49	353	754	7.2	44	356	751	2.5	53	365	754	8.2	39	362	750	0.7	59
3,000	363	709	2.1	47	366	707	1.9	34	366	707	0.6	51	352	709	4.3	41	354	705	−0.1	50	365	709	4.7	39	362	705	−1.2	52
4,000	352	626	−3.4	42	366	624	−4.3	33	366	623	−6.4	52	345	627	−2.2	38	352	622	−6.1	48	365	627	−2.0	38	358	621	−6.6	47
5,000	346	551	−9.3	42	363	549	−10.8	----	365	547	−13.3	50	339	552	−8.6	35	347	547	−12.4	42	364	552	−8.6	39	356	546	−12.3	43
6,000	334	483	−15.5	----	361	481	−17.7	----	365	479	−20.4	52	337	484	−15.2	----	346	479	−19.1	40	363	484	−15.5	37	354	478	−18.6	40
7,000	331	423	−22.4	----	360	420	−25.0	----	364	418	−27.6	----	333	424	−22.2	----	344	418	−26.2	----	362	423	−22.6	----	349	417	−25.4	----
8,000	322	368	−29.5	----	358	365	−32.5	----	362	362	−35.2	----	321	369	−29.4	----	334	363	−33.3	----	359	368	−30.0	----	344	363	−32.3	----
9,000	314	319	−36.7	----	355	316	−39.7	----	358	313	−42.6	----	314	320	−36.5	----	324	314	−40.3	----	356	319	−37.4	----	337	314	−39.1	----
10,000	281	276	−43.8	----	347	273	−46.6	----	354	270	−49.1	----	305	276	−43.7	----	302	271	−46.5	----	352	276	−44.4	----	311	271	−45.7	----
11,000	246	238	−50.5	----	322	234	−52.4	----	351	231	−53.7	----	286	238	−50.5	----	271	233	−51.2	----	336	237	−50.6	----	275	234	−51.4	----
12,000	----	----	----	----	286	201	−56.0	----	337	198	−56.0	----	259	204	−55.6	----	241	200	−54.6	----	312	203	−55.0	----	----	----	----	----
13,000	----	----	----	----	254	171	−57.9	----	311	169	−57.0	----	----	----	----	----	----	----	----	----	280	174	−57.6	----	----	----	----	----
14,000	----	----	----	----	220	146	−59.1	----	276	144	−58.1	----	----	----	----	----	----	----	----	----	244	149	−60.7	----	----	----	----	----
15,000	----	----	----	----	168	125	−55.8	----	186	123	−59.3	----	----	----	----	----	----	----	----	----	185	127	−63.1	----	----	----	----	----
16,000	----	----	----	----	----	----	----	----	114	105	−60.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Altitude (meters) m.s.l.	Portland, Maine (20 m.)				Rapid City, S. Dak. (981 m.)				St. Louis, Mo. (171 m.)				St. Paul, Minn. (225 m.)				San Antonio, Tex. (240 m.)				San Juan, P. R. (15 m.)				Santa Maria, Calif. (71 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	362	1,014	5.5	83	363	903	6.5	70	365	997	12.6	71	365	989	8.0	75	363	988	19.1	74	350	1,014	25.1	82	363	1,008	12.3	83
500	362	956	6.4	72					365	959	12.1	63	365	956	7.2	70	363	958	19.0	69	350	959	21.5	82	363	958	13.1	68
1,000	362	899	4.3	69	363	901	6.8	69	365	903	9.7	61	365	900	4.8	70	363	904	16.5	69	350	906	18.1	79	363	902	13.6	46
1,500	362	845	2.2	67	363	848	6.9	56	365	850	7.8	58	365	846	3.0	66	363	853	14.1	65	350	855	15.2	74	363	850	11.4	40
2,000	362	794	0.0	64	363	797	4.3	55	365	800	5.6	53	365	795	1.2	60	363	803	12.0	53	350	805	12.9	62	363	800	8.6	37
2,500	362	746	−2.1	63	363	750	1.5	54	365	752	3.4	48	363	747	−1.0	54	363	757	9.6	44	350	758	10.8	50	363	753	5.9	33
3,000	362	700	−4.3	60	363	704	−1.4	53	365	707	0.8	45	363	702	−3.4	50	363	712	7.0	37	350	714	8.5	41	362	708	3.0	30
4,000	356	616	−9.4	56	363	620	−7.6	51	361	623	−5.0	43	357	617	−9.0	46	361	630	1.0	33	343	632	3.3	----	359	625	−2.8	----
5,000	351	541	−15.1	53	361	545	−14.3	50	359	548	−10.9	42	356	542	−15.1	44	358	556	−5.4	----	333	558	−2.5	----	356	550	−9.2	----
6,000	342	473	−21.5	50	359	477	−21.2	44	352	481	−17.3	38	353	474	−21.6	42	353	488	−11.7	----	325	491	−8.6	----	355	483	−16.2	----
7,000	334	412	−28.3	48	357	415	−28.5	----	347	420	−24.4	40	349	413	−28.7	----	353	428	−18.6	----	317	431	−15.3	----	354	422	−23.7	----
8,000	312	358	−35.2	----	348	360	−35.7	----	340	365	−31.5	----	339	358	−35.9	----	350	373	−25.8	----	309	377	−22.2	----	345	367	−31.1	----
9,000	292	309	−41.8	----	329	311	−42.8	----	324	316	−38.6	----	309	310	−42.6	----	342	324	−33.1	----	301	328	−29.6	----	338	318	−38.6	----
10,000	266	266	−47.5	----	305	268	−49.2	----	280	274	−45.3	----	268	267	−48.1	----	337	291	−40.4	----	293	285	−37.1	----	326	274	−45.7	----
11,000	231	229	−51.7	----	258	230	−53.8	----	237	237	−50.6	----	----	----	----	----	316	242	−47.8	----	279	246	−44.7	----	307	236	−51.9	----
12,000	200	197	−54.1	----	190	198	−55.9	----	----	----	----	----	----	----	----	----	272	208	−53.7	----	245	211	−52.0	----	274	202	−56.4	----
13,000	----	----	----	----	142	169	−56.4	----	----	----	----	----	----	----	----	----	----	----	----	----	195	181	−59.3	----	238	172	−58.4	----
14,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	202	148	−60.5	----
15,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	156	126	−62.7	----

Altitude (meters) m.s.l.	Sault Ste. Marie, Mich. (221 m.)				Spokane, Wash. (598 m.)				Swan Island, West Indies (10 m.)				Tacubaya, Mexico (2,306 m.)				Tampa, Fla. (3 m.)				Tatoosh Island, Wash. (31 m.)				Toledo, Ohio (191 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	358	990	4.0	84	365	945	10.3	63	341	1,013	25.7	81	364	774	15.7	58	344	1,018	20.8	82	364	1,013	9.6	85	358	995	8.3	80
500	358	957	4.4	80					341	958	22.2	82					344	961	19.2	71	364	957	8.7	74	358	958	8.8	70
1,000	358	899	2.7	74	365	901	9.4	56	341	905	19.0	77					344	907	16.6	67	364	901	6.7	68	358	902	6.4	68
1,500	358	845	0.8	71	365	848	6.2	56	341	854	16.2	69					344	856	13.9	62	364	848	4.4	63	358	849	4.2	65
2,000	358	794	−1.4	69	365	797	3.3	58	341	804	13.8	56					342	806	11.6	51	364	797	1.7	59	358	797	2.0	62
2,500	358	743	−3.4	66	365	749	−0.4	54	341	758	11.8	45	364	750	14.6	56	342	759	9.4	41	364	749	0.8	54	358	749	−0.2	56
3,000	358	699	−5.7	63	365	704	−3.6	60	339	714	9.7	36	364	713	11.2	59	339	714	6.9	36	363	703	−3.5	50	358	704	−2.5	50
4,000	354	615	−10.9	58	363	619	−9.6	55	333	632	4.4	----	364	632	3.5	70	337	632	1.4	32	358	619	−9.4	48	356	620	−7.9	44
5,000	345	539	−16.7	55	362	543	−15.8	44	327	559	−1.3	----	361	558	−3.0	66	333	557	−4.5	----	354	543	−15.7	46	354	544	−13.8	43
6,000	339	472	−23.1	50	358	475	−22.4	39	312	492	−7.2	----	356	491	−8.9	52	330	490	−10.7	----	345	475	−22.4	40	352	476	−20.2	41
7,000	332	411	−29.9	48	355	414	−29.7	----	309	432	−13.7	----	353	431	−15.2	49	327	430	−17.5	----	340	413	−29.6	----	350	415	−27.1	----
8,000	317	356	−36.6	----	338	359	−36.9	----	290	378	−20.6	----	345	377	−22.1	47	316	375	−24.5	----	336	358	−36.9	----	347	361	−34.1	----
9,000	292	308	−43.0	----	316	310	−44.0	----	291	329	−27.8	----	340	328	−29.6	----	313	326	−31.8	----	324	309	−43.8	----	331	312	−40.7	----
10,000	263	265	−48.8	----	294	267	−50.3	----	283	286	−35.5	----	337	285	−37.4	----	306	282	−39.6	----	301	267	−50.1	----	296	269	−46.5	----
11,000	223	229	−51.9	----	245	228	−54.2	----	275	247	−43.5	----	324	245	−45.4	----	291	243	−47.1	----	276	229	−54.6	----	268	231	−51.2	----
12,000	181	195	−53.0	----	205	196	−55.1	----	263	213	−51.5	----	266	211	−53.1	----	258	209	−53.8	----	237	195	−56.5	----	236	198	−54.4	----
13,000	----	----	----	----	----	----	----	----	241	182	−59.0	----	182	180	−60.6	----	203	179	−59.9	----	194	167	−55.3	----	187	169	−56.3	----
14,000	----	----	----	----	----	----	----	----	172	155	−65.2	----	----	----	----	----	----	----	----	----	137	143	−54.6	----	----	----	----	----

Altitude (meters) m. s. l.	Washington, D. C. (25 m.)			
	Number of observations	Pressure	Temperature	Relative humidity
Surface	365	1,015	12.7	71
500	365	959	11.4	64
1,000	365	904	9.0	64
1,500	365	851	6.6	64
2,000	365	800	4.2	61
2,500	365	752	1.8	56
3,000	365	706	−0.5	50
4,000	360	623	−5.8	44
5,000	328	548	−11.7	42

Altitude (meters) m. s. l.	Washington, D. C. (25 m.)			
	Number of observations	Pressure	Temperature	Relative humidity
6,000	355	480	−18.1	----
7,000	354	419	−24.7	----
8,000	354	364	−31.7	----
9,000	349	315	−38.7	----
10,000	338	272	−45.5	----
11,000	311	231	−51.5	----
12,000	280	200	−55.7	----
13,000	235	171	−58.2	----
14,000	184	146	−60.3	----

[1] Data for 11 months; April missing.
[2] Data for 11 months; October missing.

NOTE.—All data are based on observations for 12 months, except as otherwise indicated.

At some stations, higher levels were not available during 1 or 2 months. These data are not published for any level where observations were missing for more than 1 month in the same season, or more than 2 months during the year.

TABLE 2A.—*Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during December 1944. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second*

Altitude (meters) m. s. l.	Abilene, Tex. (538 m.)			Albuquerque, N. Mex. (1,630 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (512 m.)			Boise, Idaho (870 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (132 m.)			Charleston, S. C. (17 m.)			Cincinnati, Ohio (152 m.)			Denver, Colo. (1,627 m.)			El Paso, Tex. (1,196 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	25	9	0.7	31	321	0.3	26	279	2.7	30	241	3.8	31	287	3.4	25	102	0.3	28	131	2.0	25	250	4.2	29	233	1.4	29	279	1.7	25	285	1.6	31	40	1.6	30	301	0.8
500							26	279	2.8										28	152	2.4	25	253	5.6	29	231	4.5	29	273	3.6	25	259	2.7						
1,000	25	269	2.6				26	271	4.6				31	298	7.6	25	115	0.9	26	185	2.3	22	272	7.6	28	257	5.7	28	271	5.7	22	259	4.8				30	300	0.6
1,500	20	284	6.3				24	269	5.9	30	279	7.8	28	302	8.9	25	148	2.4	20	284	2.4	15	270	9.2	22	270	7.4	27	277	8.1	17	267	7.8				29	260	1.8
2,000	20	289	7.2	31	255	1.4	22	278	7.7	30	296	9.5	23	288	10.8	22	205	2.7	19	284	3.7	13	269	10.6	19	282	8.9	23	281	9.4	15	268	9.9	31	352	2.3	29	263	3.8
2,500	20	294	7.8	31	263	3.5	19	281	8.8	29	297	10.4	24	299	11.9	19	255	4.3	15	282	5.0	12	274	11.0	15	284	11.5	19	285	11.4	12	2 8	10.5	30	328	4.4	29	263	3.8
3,000	19	303	8.9	28	282	6.1	19	278	11.1	29	303	12.0	21	300	13.1	19	266	4.8	13	286	7.0	10	274	12.9	13	289	14.3	17	276	12.7	10	293	13.4	29	313	5.8	27	276	3.5
4,000	18	299	12.9	27	291	9.8	17	286	14.8	25	305	12.6	18	299	15.6	15	267	6.5	11	290	9.2				10	283	17.8	15	277	16.7				27	304	9.6	22	293	7.3
5,000	15	297	13.2	26	292	12.8	15	285	18.1	21	314	14.0	16	294	17.4	13	285	7.4	11	275	14.1							12	292	18.8				25	300	12.3	13	313	0.8
6,000	12	287	14.1	25	286	15.0	12	273	21.7	19	323	14.5	13	286	19.1	10	299	7.5	11	274	17.5							10	288	23.6				21	282	13.2			
8,000				23	287	17.9				12	331	13.4																					14	277	17.9			
10,000				15	277	25.0																																	

Altitude (meters) m. s. l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,413 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.)			Las Vegas, Nev. (578 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (410 m.)			Miami, Fla. (15 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (194 m.)			New York, N. Y. (15 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	31	354	0.6	31	315	1.1	24	284	1.9	30	262	3.3	29	330	1.2	26	267	2.7	31	29	0.7	22	313	0.4	25	313	0.7	31	75	1.8	27	294	0.8	24	253	1.7	2	315	3.9
500							24	278	3.2				29	285	1.9	26	272	4.3				22	321	1.2	25	340	0.6	31	58	2.9	27	238	1.8	24	236	3.0	2	286	4.4
1,000							24	270	5.7	30	265	6.0	27	270	2.5	21	285	5.8	31	35	1.6	18	238	4.0	24	144	3.5	31	58	2.3	24	268	2.7	17	226	3.8	25	296	6.5
1,500				31	323	1.4	24	285	8.2	29	288	8.7	26	284	4.7	19	286	7.2	31	25	2.0	18	265	6.7	22	159	5.2	31	36	1.3	22	279	4.9	15	249	5.7	21	302	8.3
2,000	31	346	0.6	31	334	0.7	24	289	9.4	29	302	8.9	24	291	6.4	15	285	10.4	31	6	1.4	17	275	8.8	21	195	4.3	27	306	0.6	21	291	6.7	15	275	8.9	10	313	9.3
2,500	31	297	1.0	30	278	1.3	20	291	12.1	27	306	11.0	21	288	9.1	13	280	12.6	31	308	1.5	16	279	10.5	19	197	4.9	23	233	2.2	17	280	7.8	15	277	11.1			
3,000	29	325	2.0	30	273	3.2	19	281	14.1	21	300	13.4	21	282	10.8	12	283	15.5	30	311	2.6	16	282	10.7	17	193	4.9	23	244	3.7	14	266	7.6	14	280	11.9			
4,000	26	311	3.2	25	293	6.9	18	282	15.5	13	308	13.8	17	277	11.9				28	310	4.7	13	294	15.1	14	186	6.3	18	251	8.0				12	287	16.8			
5,000	22	312	5.0	19	304	8.3	15	285	18.5	12	313	15.5	16	273	16.2				28	301	5.8	13	298	18.9	13	192	5.5	13	246	10.4				12	288	17.9			
6,000	22	310	5.8	16	323	10.1	14	274	19.7				13	267	18.6				28	298	8.8	12	293	20.7	10	189	4.0	11	245	11.4				10	291	17.6			
8,000	22	304	8.2																26	290	13.5																	
10,000	19	306	11.8																19	290	17.8																	
12,000	17	289	15.5																11	278	23.9																	
14,000	12	297	16.9																																			

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (402 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Paul, Minn. (225 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (15 m.)			Sault Ste. Marie, Mich. (225 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (34 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	29	188	1.0	22	324	3.4	26	331	2.7	31	84	0.7	29	337	4.9	28	296	1.6	25	301	3.4	25	314	1.6	31	284	2.6	23	313	2.4	29	52	0.6	27	159	0.7	27	306	2.9
500	29	88	1.8	22	320	3.3	26	323	2.6	31	78	0.7				28	288	3.0	25	303	4.8	25	314	2.0	31	313	1.4	23	289	3.2	29	144	2.7				27	282	4.6
1,000	26	133	1.8	22	324	4.4	23	306	5.0	31	87	1.4	29	335	5.2	22	283	5.0	24	287	6.2	24	289	2.6	29	96	1.3	15	300	4.6	25	171	3.2	27	180	2.3	26	286	7.1
1,500	24	169	2.6	22	318	6.7	22	306	8.2	31	98	1.3	29	323	9.5	20	285	6.4	21	300	8.9	22	295	4.5	29	97	1.5				24	193	3.0	23	212	3.7	24	291	10.5
2,000	22	173	3.2	19	317	10.4	19	306	10.5	30	100	0.4	27	316	10.5	17	282	9.2	18	297	10.8	21	300	6.0	28	71	0.1				22	215	3.1	16	241	3.9	20	294	11.4
2,500	20	168	2.2	19	318	10.3	17	302	12.4	30	301	0.5	25	312	11.6	17	286	10.4	16	295	11.6	15	299	6.9	27	324	0.8				19	252	3.2	13	264	6.0	18	292	13.6
3,000	20	186	2.2	19	309	11.8	17	301	14.6	28	301	2.0	23	312	12.7	15	281	12.5	14	296	12.6	15	295	8.3	25	285	2.1				16	252	3.2	11	296	4.1	18	287	14.0
4,000	19	180	2.4	18	298	13.8	13	307	18.3	26	294	6.0	22	304	14.3	11	285	14.2	10	296	14.7	15	285	10.7	23	273	4.2				13	267	2.7	10	312	7.4	16	285	16.8
5,000	18	216	4.1	17	300	14.5	10	306	20.5	24	301	7.1	21	298	17.2							13	284	13.6	23	274	5.0				12	288	3.7				15	287	17.7
6,000	16	246	5.2	13	292	17.1				21	291	10.1	15	297	15.8							12	283	15.9	21	264	8.2				12	277	1.9				11	290	17.4
8,000	14	261	6.3							19	282	15.0													18	264	10.0				12	304	4.3						
10,000	11	243	6.8							12	280	21.0													14	265	15.9												
12,000																									10	268	23.9												

TABLE 2B.—*Free-air resultant winds based on pilot-balloon observations made near 5 p. m. (75th meridian time) during the year 1944. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second*

Altitude (meters) m. s. l.	Abilene, Tex. (538 m.)			Albuquerque, N. Mex. (1,630 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (512 m.)			Boise, Idaho (870 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (17 m.)			Cincinnati, Ohio (152 m.)			Denver, Colo. (1,627 m.)			El Paso, Tex. (1,198 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	349	174	2.5	363	230	1.8	334	276	1.1	354	276	1.4	351	272	0.7	356	317	2.6	354	121	4.3	337	256	2.6	346	248	1.2	345	217	0.6	355	261	1.3	360	49	1.2	364	238	2.1
500							334	278	1.6										354	132	4.9	337	255	3.9	346	233	3.0	345	218	1.7	355	252	2.5						
1,000	348	188	3.6				328	273	2.1				348	292	2.6	356	316	2.3	307	142	3.7	295	256	5.4	327	256	4.8	321	257	2.8	329	251	3.4						
1,500	333	204	3.9				316	277	2.9	354	274	2.9	323	287	3.0	355	295	1.5	272	153	2.3	251	262	5.9	297	272	6.3	305	278	4.0	297	257	4.9				364	234	2.3
2,000	319	221	4.4	363	230	2.6	295	284	4.4	344	284	3.9	292	285	4.3	344	267	1.9	240	179	1.3	215	269	7.0	254	281	7.8	281	287	5.6	257	268	6.0	360	45	1.1	361	244	3.0
2,500	300	235	4.8	362	242	3.2	270	288	5.7	335	282	4.8	268	289	5.9	316	268	2.8	224	203	1.5				208	286	9.2	253	290	7.1	214	276	6.7	347	328	0.4	352	242	3.7
3,000	283	247	5.9	354	253	4.3	241	287	7.0	312	282	6.3	237	290	7.7	310	251	3.5	204	237	1.9				149	289	9.5	238	287	7.7	187	283	7.2	333	278	1.9	345	249	4.6
4,000	258	262	7.7	309	263	6.7	202	289	9.2	268	281	8.3	207	288	9.6	266	267	4.6	179	247	3.1							192	286	9.2				303	278	5.6	306	254	7.3
5,000	232	266	8.8	260	268	9.0	144	286	11.6	226	278	9.5	162	290	11.1	229	267	6.4	152	262	4.4							143	290	10.2				276	277	8.6	254	259	8.6
6,000	184	268	9.4	218	264	10.0				176	279	10.0	140	292	12.7	198	267	7.5																238	272	10.8	194	252	7.1
8,000																																		157	266	15.0			

Altitude (meters) m. s. l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,413 m.)[1]			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joliet, Ill. (178 m.			Las Vegas, Nev. (573 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (13 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (194 m.)			New York, N. Y. (15 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	366	217	1.5	359	29[illegible]	1.4	32[illegible]	24[illegible]	1.3	34[illegible]	29[illegible]	1.7	35[illegible]	8[illegible]	1.6	34[illegible]	23[illegible]	1.7	36[illegible]	16[illegible]	0.8	33[illegible]	16[illegible]	0.8	34[illegible]	31[illegible]	1.3	36[illegible]	11[illegible]	2.1	32[illegible]	20[illegible]	0.8	34[illegible]	25[illegible]	1.2	33[illegible]	27[illegible]	1.6
500							32[illegible]	24[illegible]	2.0				35	14[illegible]	0.5	34[illegible]	25[illegible]	2.4				33[illegible]	19[illegible]	1.2	34[illegible]	31[illegible]	1.5	36[illegible]	10[illegible]	3.1	32[illegible]	20[illegible]	1.5	34[illegible]	24[illegible]	2.0	33[illegible]	27[illegible]	3.3
1,000							31[illegible]	25[illegible]	2.9	34[illegible]	25[illegible]	2.8	33[illegible]	23[illegible]	1.4	30[illegible]	24[illegible]	3.4	36[illegible]	17[illegible]	1.4	32[illegible]	22[illegible]	2.0	34[illegible]	28[illegible]	0.6	35[illegible]	10[illegible]	2.0	28[illegible]	25[illegible]	1.4	32[illegible]	24[illegible]	2.8	31[illegible]	27[illegible]	5.1
1,500				35[illegible]	29[illegible]	1.7	31[illegible]	27[illegible]	4.3	34[illegible]	26[illegible]	4.2	31[illegible]	26[illegible]	3.1	27[illegible]	25[illegible]	4.8	36[illegible]	19[illegible]	1.7	31[illegible]	25[illegible]	3.3	33[illegible]	23[illegible]	1.4	34[illegible]	82	0.6	26[illegible]	29[illegible]	2.4	30[illegible]	26[illegible]	3.8	29[illegible]	29[illegible]	6.8
2,000	360	219	1.7	35[illegible]	27[illegible]	1.9	29[illegible]	28[illegible]	6.0	32[illegible]	27[illegible]	5.2	29[illegible]	27[illegible]	4.4	22[illegible]	26[illegible]	6.3	35[illegible]	21[illegible]	2.1	28[illegible]	26[illegible]	4.7	32[illegible]	23[illegible]	2.0	31[illegible]	31[illegible]	0.6	23[illegible]	29[illegible]	3.4	28[illegible]	27[illegible]	5.1	24[illegible]	29[illegible]	7.8
2,500	360	229	2.1	35[illegible]	24[illegible]	2.4	26[illegible]	28[illegible]	7.8	30[illegible]	27[illegible]	6.1	27[illegible]	28[illegible]	5.4	18[illegible]	27[illegible]	7.4	35[illegible]	23[illegible]	2.8	26[illegible]	27[illegible]	6.0	30[illegible]	23[illegible]	2.1	29[illegible]	27[illegible]	1.2	19[illegible]	29[illegible]	4.1	25[illegible]	27[illegible]	6.5	19[illegible]	29[illegible]	8.3
3,000	349	235	2.4	342	249	3.7	236	286	9.5	264	278	7.1	258	281	6.1	153	282	8.3	336	230	3.8	255	277	6.6	272	260	1.9	269	290	2.1	147	295	4.1	235	281	7.7			
4,000	293	252	3.5	271	257	5.2	187	281	12.5	181	274	6.9	226	277	7.5				321	257	4.8	206	282	8.7	230	280	3.2	240	262	3.4				203	284	10.0			
5,000	248	257	5.4	187	263	5.6							200	278	9.2				300	262	6.3	163	289	9.0	184	277	4.3	215	262	4.5				161	287	13.1			
6,000	213	261	6.6										175	276	10.4				287	251	8.5				162	284	5.1	194	265	5.7									
8,000																			238	272	10.6																		

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Paul, Minn. (225 m.)			San Antonio, Tex. (240 m.)			San Diego,[1] Calif. (13 m.)			Sault Ste. Marie, Mich. (225 m.)			Seattle, Wash. (13 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	35[illegible]	26[illegible]	3.5	33[illegible]	18[illegible]	2.9	34[illegible]	22[illegible]	0.7	36[illegible]	24[illegible]	0.7	33[illegible]	354	1.4	34[illegible]	244	1.4	348	246	1.3	345	134	2.0				32[illegible]	279	1.8	34[illegible]	258	1.4	35[illegible]	222	1.3	32[illegible]	275	1.2
500	35[illegible]	28[illegible]	2.3	33[illegible]	18[illegible]	3.1	34[illegible]	21[illegible]	1.3	36[illegible]	24[illegible]	1.1				34[illegible]	246	2.4	348	249	1.5	344	139	2.4				32[illegible]	276	2.3	34[illegible]	208	1.7				32[illegible]	268	2.3
1,000	32[illegible]	29[illegible]	1.5	33[illegible]	19[illegible]	3.6	32[illegible]	22[illegible]	2.6	36[illegible]	22[illegible]	1.3	33[illegible]	348	1.6	32[illegible]	246	3.4	299	250	3.0	322	169	2.6				27[illegible]	273	4.2	30[illegible]	201	2.9	35[illegible]	216	2.0	31[illegible]	276	4.0
1,500	31[illegible]	30[illegible]	1.9	31[illegible]	22[illegible]	4.3	29[illegible]	24[illegible]	3.9	36[illegible]	20[illegible]	1.7	33[illegible]	324	2.5	30[illegible]	261	4.6	274	267	4.5	275	171	2.4				23[illegible]	276	5.3	27[illegible]	210	3.3	33[illegible]	224	3.1	31[illegible]	283	5.5
2,000	29[illegible]	31[illegible]	1.9	28[illegible]	24[illegible]	5.6	24[illegible]	26[illegible]	5.9	35[illegible]	20[illegible]	2.3	32[illegible]	297	4.0	27[illegible]	269	6.4	238	274	6.2	276	208	2.3							23[illegible]	217	3.1	29[illegible]	236	3.6	26[illegible]	288	7.1
2,500	27[illegible]	32[illegible]	2.4	27[illegible]	25[illegible]	6.3	21[illegible]	27[illegible]	7.5	36[illegible]	21[illegible]	2.8	30[illegible]	289	5.7	25[illegible]	275	8.2	180	281	7.7	244	238	3.1							20[illegible]	232	3.2	26[illegible]	243	4.0	23[illegible]	290	8.9
3,000	27[illegible]	32[illegible]	2.7	26[illegible]	26[illegible]	7.3				34[illegible]	23[illegible]	3.2	27[illegible]	288	7.7	22[illegible]	277	9.3	158	292	9.0	216	256	4.3							17[illegible]	241	3.5	23[illegible]	251	3.9	22[illegible]	287	10.1
4,000	26[illegible]	31[illegible]	3.9	23[illegible]	27[illegible]	9.3				33[illegible]	24[illegible]	5.2	25[illegible]	287	9.4	17[illegible]	284	10.9				193	265	5.8										18[illegible]	261	5.3	18[illegible]	288	11.8
5,000	24[illegible]	30[illegible]	5.2	20[illegible]	27[illegible]	11.3				29[illegible]	25[illegible]	6.3	20[illegible]	286	11.2							150	270	8.6															
6,000	22[illegible]	30[illegible]	6.5	16[illegible]	27[illegible]	13.2				27[illegible]	26[illegible]	8.4	17[illegible]	285	11.8																								
8,000										20[illegible]	25[illegible]	10.4																											

[1] Insufficient data.

NOTE.—All data are based on observations during 12 months except at Caribou, where data were not available for April. At some stations data were missing during 1 or 2 months at higher levels. Data not published for any level where observations are missing for more than 1 month in the same season or more than 2 months during the year.

TABLE 3A.—*Maximum free air wind velocities (m. p. s.), for different sections of the United States based on pilot balloon observations during December 1944*

Section	Surface to 2,500 meters (m. s. l.)					Above 2,500 to 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast [1]	47.5	NW.	1,557	28	Portland, Maine	68.0	WNW.	4,220	28	Albany, N. Y.	80.0	WNW.	6,120	28	Albany, N. Y.
East-Central [2]	38.8	SW.	619	18	Hatteras, N. C.	48.8	W.	3,192	20	Huntington, W. Va.	64.8	NW.	6,865	19	Knoxville, Tenn.
Southeast [3]	39.0	NW.	2,500	19	Charleston, S. C.	44.0	NW.	2,627	19	Charleston, S. C.	60.2	WSW.	11,607	15	Miami, Fla.
North-Central [4]	48.5	NNW.	2,152	18	Rapid City, S. Dak.	49.2	WSW.	4,892	25	Milwaukee, Wis.	53.6	WSW.	5,162	25	Milwaukee, Wis.
Central [5]	50.2	NNE.	1,700	13	Dodge City, Kans.	41.2	WNW.	4,548	15	Springfield, Mo.	48.4	WSW.	6,783	30	Goodland, Kans.
South-Central [6]	35.0	NW.	2,080	11	Lake Charles, La.	49.0	NW.	4,763	12	Little Rock, Ark.	67.4	WSW.	7,799	10	Waco, Tex.
Northwest [7]	30.2	WNW.	1,820	19	Glasgow, Mont.	42.0	SSW.	3,262	27	Eugene, Oreg.	67.6	NW.	7,755	4	Glasgow, Mont.
West-Central [8]	30.0	WNW.	2,291	31	Cheyenne, Wyo.	44.0	NW.	5,000	31	Ely, Nev.	53.2	WNW.	16,185	13	Ely, Nev.
Southwest [9]	47.0	NE.	2,500	4	Mt. Laguna, Calif.	40.8	NNW.	4,778	10	El Paso, Tex.	84.0	WSW.	10,635	29	Albuquerque, N. Mex

[1] Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.
[2] Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.
[3] South Carolina, Georgia, Florida, and Alabama.
[4] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[5] Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.
[6] Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.
[7] Montana, Idaho, Washington, and Oregon.
[8] Wyoming, Colorado, Utah, northern Nevada, and northern California.
[9] Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

TABLE 3B.—*Maximum free air wind velocities (m. p. s.) for different sections of the United States based on pilot-balloon observations during the year 1944*

Section	Surface to 2,500 meters (m. s. l.)					Above 2,500 to 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast [1]	50.8	NW.	2,265	Jan. 30	New York, N. Y.	68.0	WNW.	4,220	Dec. 28	Albany, N. Y.	90.0	NW.	10,903	Apr. 23	Caribou, Maine.
East-Central [2]	48.0	E.	1,164	Oct. 18	Hatteras, N. C.	67.0	WSW.	5,000	Jan. 2	Huntington, W. Va.	86.4	WNW.	15,879	Oct. 30	Huntington, W. Va.
Southeast [3]	39.0	NW.	2,500	Dec. 19	Charleston, S. C.	54.4	WSW.	5,000	Mar. 7	Atlanta, Ga.	80.0	WSW.	14,287	Jan. 22	Miami, Fla.
North-Central [4]	48.5	NNW.	2,152	Dec. 18	Rapid City, S. Dak.	57.6	W.	4,995	Jan. 10	St. Paul, Minn.	85.5	NNW.	7,875	Jan. 22	St. Paul Minn.,
Central [5]	51.3	W.	1,168	Feb. 5	Joliet, Ill.	54.2	NW.	4,856	Nov. 23	St. Louis, Mo.	68.0	W.	6,603	Feb. 20	Goodland, Kans.
South-Central [6]	42.4	W.	2,020	Apr. 10	Del Rio, Tex.	49.0	NW.	4,763	Dec. 12	Little Rock, Ark.	85.5	WSW.	11,781	Feb. 2	Big Spring, Tex.
Northwest [7]	43.5	SW.	2,442	May 15	Burns, Oreg.	64.2	W.	4,221	Mar. 23	Ellensburg, Wash.	84.0	N.	6,711	Mar. 13	Medford, Oreg.
West-Central [8]	54.6	S.	2,214	Apr. 8	Grand Junction, Colo.	66.0	NW.	4,784	Feb. 14	Sacramento, Calif.	69.8	E.	12,951	Oct. 23	Ely, Nev.
Southwest [9]	47.0	NE.	2,500	Dec. 4	Mt. Laguna, Calif.	64.3	W.	4,498	Feb. 9	El Paso, Tex.	84.0	WSW.	10,635	Dec. 29	Albuquerque, N. Mex.

[1] Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.
[2] Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.
[3] South Carolina, Georgia, Florida, and Alabama.
[4] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[5] Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.
[6] Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except El Paso), and western Tennessee.
[7] Montana, Idaho, Washington, and Oregon.
[8] Wyoming, Colorado, Utah, northern Nevada, and northern California.
[9] Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS

By C. R. JORDAN

PRECIPITATION during December was above normal in most sections from the central Great Plains southward to the Gulf, much of the Ohio Valley, and New York and Pennsylvania. Rainfall was notably scanty in the Southeast, Central-Northern States, and the western Great Basin.

Floods, extraordinarily high for December, occurred in Kansas as a result of heavy rains in combination with frozen ground and high base flow. Moderately severe floods also occurred in West Virginia as a result of rainfall and melting of snow on December 25 and 26.

Atlantic slope drainage.—Rainfall that averaged about 2 inches fell over eastern North Carolina during the last 4 days of November that produced light overflow of the Neuse, Tar, and Roanoke Rivers during the early part of December. Crests were only a little above flood stage and no damage of consequence occurred.

MISSISSIPPI SYSTEM

Missouri Basin.—Heavy to excessive rains fell over the lower portion of the Grand River basin in the 3-day period December 3–5, 1944. Storm totals exceeded 3.50 inches at reporting stations. Sharp rises resulted; the stage at Chillicothe, Mo., rising from 5.30 feet on December 4 to 27.3 feet on the morning of the 6th. Damage resulting from this overflow was not great.

Unusually severe overflow occurred along the Marais des Cygnes (Osage) River from December 5 to 12, which was the first December overflow of record along that stream. It was due to torrential rains at and above Ottawa, especially in Osage County. The following report of the overflow was received from the Official in Charge, Weather Bureau Office, Topeka, Kans.

The crest at Quenemo was 36.35 on the 5th, 6.35 feet above bankful, and exceeded only by three previous overflows of record—those of November 1928, with a crest of 38.38; June 1935, with a crest of 36.6; and April 1944, with a crest of 38.1 feet.

At Ottawa this was the fifth greatest overflow of record, with a crest of 33.9 feet, 9.9 feet above bankful, on the 6th. Overflows that exceeded this at this point were those of May 1904, with a crest of 34.3 feet; July 1909, with a crest of 35.9 feet; November 1928, with a crest of 37.6 feet; and April 1944, with a crest of 36.5 feet.

At Osawatomie the crest was 38.8 feet, 10.8 feet above bankful, on the 7th. As this flood crest moved toward the Missouri line, it tended to flatten very materially, with the result that at Trading Post it was 27.14 feet, which was 3.7 feet lower than the crest of April 25, 1944, at that point and 7.3 feet lower than the great crest of November 18, 1928.

The greatest damage occurred at Ottawa, where the rise of the river was very rapid and there were several narrow escapes from drowning. It was estimated that in Ottawa the loss amounted to $100,000, which was about one-half as great as the loss during the great overflow of April preceding. Approximately 50 families were flooded out of their homes and there was great damage in the business section located near the river, due to flooded basements and also water over the first floor. The passenger and telegraph offices of the Sante Fe Railway were flooded and were abandoned for a few days. Train service over the north-and-south line of the Santa Fe passing through Ottawa and also over the Missouri Pacific was interruped for a day or two.

Persons forced to leave their homes in the flooded district were, in many cases, sheltered in churches and other buildings.

No other cities along the river are subject to overflow, but there was much damage to the corn crop that had been left in the fields. It was estimated that fully two-thirds of this crop had not been removed from the fields and it was an unusually good crop. Loss to this crop was near 50 percent of the loss during

the record-breaking overflow of 1928. There were also considerable losses of livestock.

The total damage of the flood, according to preliminary estimates which are subject to later revision, was $326,400, which includes $98,000 municipal damage in Ottawa. A total of 60,930 acres of land was flooded.

Ohio Basin.—High stages and some light flooding occurred in the Tygart River valley on Christmas day and the day following as a result of run-off from moderate rainfall that was augmented by melting of a rather heavy snow cover over the area. Flood stages were slightly exceeded at a few points but very little damage resulted. The same conditions produced moderate flood stages of the Monongahela on the 26th. Only minor damage was reported.

Moderately heavy rainfall in northern West Virginia on December 24–25, brought a sharp rise to above flood stage in the Little Kanawha River. At Glenville the crest was 4.2 feet above flood stage and at Creston 2.75 feet above flood stage. This was followed on the 27th by another rain of slightly more than an inch that brought a crest near flood stage at Glenville and 2.8 feet above flood stage at Creston. Little if any damage resulted.

Arkansas Basin.—Unusually heavy December rains produced stages considerably above flood stage on the Cottonwood and Neosho Rivers, about flood stage on the Arkansas at Arkansas City, Kans., and Ralston, Okla., and slightly under flood stage at Oxford, Kans. During the 3-day period, December 2–5, precipitation over the Cottonwood Basin ranged from nearly 3 inches in the headwaters to 5 inches at Emporia, Kans., and in the Neosho Basin, amounts ranged from over 4 inches at Council Grove, Kans., to slightly more than 1 inch at Oswego, Kans. Heavy rains, averaging about 3 inches, were reported from the same storm over the Verdigris and Walnut River Basins and in the immediate vicinity of Arkansas City and Oxford, Kans. The combination of rain falling on frozen ground with high base flows already prevalent produced floods that were extraordinarily high for December. The Cottonwood and upper Neosho Rivers reached stages within a foot or two of those reached in the destructive and record-breaking stages of April 1944. Minor flooding occurred along Bird Creek and Caney River; in the vicinity of Arkansas City, Kans., and Ralston, Okla.; and on the Walnut River at Eldorado, Augusta, and in the vicinity of Winfield, Kans.

Considerable damage resulted from the overflow, occurring mostly in the Cottonwood below Florence, Kans., and along the Neosho from Emporia to Iola, Kans.

Red Basin.—Heavy rains, totaling more than 5 inches at some stations from December 5–7, caused rises on the Saline, Ouachita, and Sulphur Rivers to crests that were slightly above flood stages. Very little loss resulted from the flood.

Additional heavy rains were general over much the same area during the last week of December and the Ouachita and Sulphur Rivers again overflowed. The flooding continued into January and will be discussed more fully in the report for next month.

West Gulf drainage.—Moderately heavy rain over western Louisiana and eastern Texas during the last few days of December caused rises in the streams of that area with light overflow at a few points along the Calcasieu, Trinity, and Guadalupe Rivers. No damage was reported except along the lower Trinity River where the loss is estimated at $6,000.

FLOOD-STAGE REPORT FOR DECEMBER 1944

[All dates in December unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest [1]	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE	*Feet*			*Feet*	
Roanoke: Williamston, N. C.	10	4	6	10.3	5
		15	17	10.1	16
Tar:					
Rocky Mount, N. C.	9	2	2	9.1	2
Tarboro, N. C.	18	4	4	18.0	4
Greenville, N. C.	13	5	7	13.4	5
Neuse:					
Neuse, N. C.	14	Nov. 28	3	17.0	1
Smithfield, N. C.	13	Nov. 29	4	16.8	2
Cape Fear: Lock No. 2, Elizabethtown, N. C.	20	1	3	21.6	2
MISSISSIPPI SYSTEM					
Missouri Basin					
Grand:					
Gallatin, Mo.	20	5	6	21.3	5
Chillicothe, Mo.	18	5	7	27.3	6
Brunswick, Mo.	12	6	9	13.5	6
Osage:					
Quenemo, Kans.	30	4	7	36.4	5
Ottawa, Kans.	24	5	8	33.9	6
Osawatomie, Kans.	28	5	10	38.8	7
La Cygne, Kans.	25	6	11	30.2	9
Trading Post, Kans.	24	6	12	27.2	10
Ohio Basin					
Tygart: Philippi, W. Va.	17	25	26	19.6	26
West Fork:					
Weston, W. Va.	17	25	26	19.0	26
Clarksburg, W. Va.	5	25	27	8.4	26
Middle Fork: Midvale, W. Va.	11	26	26	12.0	26
Monongahela:					
Lock No. 7, Greensboro, Pa.	30	25	26	33.7	26
Lock No. 4, Charleroi, Pa.	30	26	26	31.1	26
Lock No. 2, Braddock, Pa.	20.5	26	28	27.0	27
Little Kanawha:					
Glenville, W. Va.	23	25	26	27.2	26
Creston, W. Va.	20	26	27	22.8	27
Arkansas Basin					
Little Arkansas: Sedgwick, Kans.	18	5	6	23.2	5
Walnut:					
Eldorado, Kans.	9	4	5	10.6	5
Winfield, Kans.	23	----------	----------	31.9	7
Cottonwood:					
Cottonwood Falls, Kans.	9	4	7	[2] 15.0	5
Emporia, Kans.	20	4	10	26.0	6
Neosho:					
Council Grove, Kans.	24	----------	----------	25.1	5
Neosho Rapids, Kans.	22	5	9	27.6	5
Burlington, Kans.	27	4	10	34.3	6
LeRoy, Kans.	23	4	10	27.5	7
Iola, Kans.	15	5	12	21.1	8
Chanute, Kans.	20	5	12	27.7	10
Parsons, Kans.	22	7	----------	26.5	14
Oswego, Kans.	17	6	15	23.05	14
Petit Jean: Danville, Ark.	20	8	10	21.2	9
Arkansas:					
Arkansas City, Kans.	16	5	7	16.85	6
Ralston, Okla.	16	7	7	16.0	7
Red Basin					
Saline: Benton, Ark.	20	7	7	22.0	7
Ouachita:					
Arkadelphia, Ark.	17	7	9	19.8	7
		26	27	17.7	26
		27	30	19.3	29
Camden, Ark.	26	10	15	28.4	13
		29	[3]	----------	----------
Sulphur:					
Hagansport, Tex.	38	6	6	38.7	6
		8	8	38.2	8
		27	31	39.7	28
Naples, Tex.	22	9	15	24.1	12
		30	[3]	----------	----------
WEST GULF OF MEXICO DRAINAGE					
Calcasieu: Kinder, La.	16	29	31	16.4	29
East Fork: Rockwall, Tex.	10	28	[3]	----------	----------
Trinity:					
Trinidad, Tex.	28	30	[3]	----------	----------
Liberty, Tex.	24	7	12	26.2	10
Guadalupe: Gonzales, Tex.	20	7	7	20.8	7

[1] Provisional.
[2] Estimated, water over gage.
[3] Continued at end of month.

CLIMATOLOGICAL DATA

CONDENSED CLIMATOLOGICAL SUMMARY OF TEMPERATURE AND PRECIPITATION BY SECTIONS

[For description of tables and charts, see REVIEW, January 1943, p. 15]

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Section	Temperature								Precipitation					
			Monthly extremes								Greatest monthly		Least monthly	
	Section average	Departure from the normal	Station	Highest	Date	Station	Lowest	Date	Section average	Departure from the normal	Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	46.5	−1.2	Andalusia	78	30	Valley Head	12	2	3.70	−1.52	Waterloo	11.63	Union Springs	0.74
Arizona	43.7	+.9	Tempe Veg. Farm	80	21	Fort Valley	−6	31	1.17	−.13	Crown King	4.15	Inner Canyon	T
Arkansas	38.0	−4.8	Marshall	76	20	Gravette	4	12	7.86	+3.59	Warren	14.37	Odell	2.29
California	46.8	+1.0	El Cajon	87	19	Ellery Lake	−12	130	2.82	−1.05	Upper Mattole	16.62	2 stations	.00
Colorado	26.1	+.3	Eversoll Ranch	70	20	Taylor Dam	−31	31	.79	−.11	Cumbres	8.20	Conejos Dam	T
Florida	66.8	−3.0	Stuart	92	9	2 stations	18	15	.78	−1.98	Miami Beach	3.27	3 stations	.00
Georgia	44.3	−3.4	Quitman	80	31	Blairsville	2	15	2.08	−2.19	Ellijay	5.74	Brunswick Airport	.30
Idaho	24.9	−1.6	Lewiston	58	5	Island Park Dam	−25	23	1.38	−.68	Roland	4.94	Mackay	.19
Illinois	25.0	−6.0	Carbondale	67	20	2 stations	−24	26	1.66	−.44	Elizabethtown	4.93	Joliet Airport	.77
Indiana	26.6	−5.6	Marengo	59	6	Frankfort	−15	26	1.95	−.78	Scottsburg	4.05	Farmersburg	.85
Iowa	20.6	−3.6	Keokuk	47	4	Marshalltown	−25	26	1.29	+.11	Melrose	3.21	Rock Rapids	T
Kansas	30.8	−2.3	3 stations	64	20	Horton	−5	26	2.15	+1.25	Reading	5.83	Long Island	.15
Kentucky	33.0	−4.7	Pikeville	63	25	2 stations	5	114	3.62	−.21	Bowling Green	6.48	St. John	1.58
Louisiana	49.6	−2.9	Donaldsonville	82	25	3 stations	19	112	6.09	+.74	Ruston	14.12	Cinclare	1.55
Maryland - Delaware.	32.9	−2.4	Salisbury, Md.	62	25	Oakland, Md.	−14	22	3.34	+.19	Oakland, Md.	5.84	Ocean City, Md.	1.60
Michigan	22.1	−3.5	2 stations	47	5	Vanderbilt	−25	21	1.58	−.46	Phoenix	4.69	Stambaugh	.39
Minnesota	16.6	+.7	Beardsley	48	16	Big Falls	−29	21	.23	−.52	Pigeon River Bridge	.81	Angus	.01
Mississippi	46.2	−2.2	2 stations	80	125	Water Valley	15	14	6.97	+1.64	University	14.84	Leakesville	.70
Missouri	29.1	−5.1	Arcadia	70	20	Louisiana	−14	26	2.26	+.07	Caruthersville	6.28	Springfield	.91
Montana	21.8	−1.7	Grass Range	68	5	West Yellowstone	−41	23	.58	−.36	Heron	2.24	Culbertson	.00
Nebraska	25.6	−1.6	Bridgeport	59	6	Gordon	−19	25	.39	−.29	Falls City	2.68	Fullerton	T
Nevada	30.8	−.6	2 stations	70	17	Fish Creek Ranch	−30	14	.45	−.54	Mariette Lake	2.86	5 stations	.00
New England	23.8	−2.6	Nantucket, Mass.	55	12	Lake Frontiere, Maine.	−36	19	3.12	−.19	Machias, Maine	6.01	Bethlehem, N. H.	1.02
New Jersey	30.7	−3.1	Flemington	58	5	Layton	−14	22	3.02	−.53	Dover	5.38	Layton	1.74
New Mexico	34.0	−.2	3 stations	79	113	Selsor Ranch	−27	31	.81	+.09	Selsor Ranch	2.85	2 stations	.00
New York	22.9	−3.8	New York	55	8	Wanakena	−27	29	3.26	+.32	Little Valley	6.55	Chazy	.72
North Carolina	38.0	−4.5	Goldsboro	78	25	2 stations	−2	15	2.72	−1.08	Andrews	7.50	Manteo	1.30
North Dakota	15.8	+2.3	Medora	50	6	Bottineau	−27	23	.06	−.41	Towner	.43	46 stations	T
Ohio	26.1	−5.6	Jackson	61	5	3 stations	−17	122	2.89	+.18	Chesapeake	5.18	Sidney	1.34
Oklahoma	37.5	−2.5	6 stations	69	16	Watts	7	12	2.46	+.74	Idabel	7.53	Kenton	.38
Oregon	32.4	−1.3	Port Oxford	77	12	Joseph	−6	24	1.72	−2.13	Gold Beach	9.33	Mikkalo	.12
Pennsylvania	26.3	−5.0	Phoenixville	60	9	2 stations	−26	22	3.79	+.69	Lycippus	7.19	Lawrenceville	1.77
South Carolina	42.0	−4.7	Ridgeland	77	31	Walhalla	12	13	1.44	−2.13	Longereck	3.87	Walterboro	.39
South Dakota	22.3	+.2	Rapid City	60	6	Custer	−26	24	.24	−.28	Deadwood	1.81	7 stations	T
Tennessee	36.4	−4.3	Knoxville Airport	68	31	Rugby	2	3	6.07	+1.54	Memphis	11.97	Greenville	3.09
Texas	46.2	−2.7	Harlingen	87	21	Miami	8	1	3.46	+1.14	Jefferson	11.51	Friona	.30
Utah	28.9	+1.7	2 stations	63	14	Woodruff	−11	16	.88	−.22	Silver Lake(Brighton)	4.02	Callao	.00
Virginia	33.8	−4.3	do.	69	25	Emory	0	15	2.67	−.38	Damascus	4.72	Timberville	1.19
Washington	31.2	−2.1	do.	65	5	Chesaw	−12	24	2.09	−3.34	Quinault	10.92	White Swan	.03
West Virginia	29.4	−5.2	4 stations	63	15	Senaca State Forest	−15	15	4.63	+1.33	Pickens	11.15	Brandywine	1.56
Wisconsin	18.1	−2.6	Iron River	48	4	Darlington	−28	26	.80	−.49	Brodhead	1.99	Mondovi	.17
Wyoming	20.3	−1.9	Torrington	60	6	Lamar Ranger Station	−40	23	.60	−.04	Snake River	3.19	2 stations	.06
Alaska (November).	16.2	+1.8	Japonski	63	20	Northway	−42	13	2.42	−.33	Little Port Walter	31.31	Sheep Mountain	T
Hawaii	69.7	−.4	2 stations	88	11	Haleakala Ranger Station	37	1	6.76	−1.74	Kukui	32.00	Puu Mali	.40
Puerto Rico														

[1] Other dates also.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station	Pressure: Sea level	Pressure: Departure from normal	Temperature of the air: Mean	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Total degree days	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	*°F.*	*°F.*	*°F.*		*°F.*	*°F.*		*°F.*	*°F*		*°F.*	*%*	*In.*	*In.*	*In.*		*Mi.*								*0–10*	*In.*	*In.*	
New England							**25.8**	**−2.2**										**74**	**3.98**	**−0.4**											**5.8**			
Eastport	75	67	85	1,012.9	1,016.3	+1.1	26.0	−.3	48	12	34	−2	30	18	34	1,209	18	70	4.30	+.6	1.34	13	12.3	w.	51	e.	12	11	9	11	5.4	15.0	9.7	0
Greenville, Maine [1]	1,070	6	41	975.3	1,016.9	....	14.9	−3.9	38	5	24	−14	20	5	36	1,553	12	....	2.80	−.3	.63	15	....	nw.	....	....	....	....	5	12	14	....	22.7	18.0	0
Portland, Maine [1]	103	5	43	1,012.5	1,017.3	+.4	23.6	−4.0	52	5	33	−8	30	14	37	1,287	18	84	3.74	−.2	1.41	11	8.8	n.	34	e.	9	13	10	8	5.0	15.4	8.2	0
Concord [1]	289	5	45	1,006.4	1,018.0	.0	22.2	−1.8	48	5	32	−9	22	12	36	1,321	14	76	2.26	−.9	.61	9	8.3	nw.	48	ne.	12	7	13	11	6.1	13.0	7.9	0
Burlington [1]	403	5	51	1,002.4	1,018.3	+.7	19.6	−4.8	41	8	28	−10	22	11	38	1,401	14	81	1.35	−.8	.43	12	9.7	s.	20	s.	7	19	7	12	7.2	13.1	8.7	0
Boston [1]	124	33	62	1,012.9	1,018.0	+.4	30.8	−1.7	59	9	38	8	22	23	24	1,062	20	66	2.83	−.6	.90	10	12.8	nw.	46	ne.	12	9	10	12	5.6	6.9	.2	0
Nantucket	12	11	59	1,016.9	1,018.0	+.4	35.2	−.6	55	12	42	15	19	24	27	925	28	76	3.39	−.4	1.20	12	13.3	w.	45	e.	12	11	6	14	6.0	2.6	.0	0
Block Island	26	11	48	1,016.9	1,018.3	+.3	34.2	−1.8	53	12	41	14	22	28	30	955	26	74	3.14	−.7	1.07	10	19.3	nw.	48	nw.	28	10	9	12	5.6	7.0	.0	0
Providence [1]	159	46	60	1,012.2	1,018.6	+.6	31.2	−.4	52	6	39	8	22	24	26	1,048	18	66	3.42	.0	1.11	10	9.5	n.	36	sw.	1	11	7	13	5.8	10.7	.5	0
Hartford [1]	159	5	44	....	1,019.3	+1.0	26.8	−3.0	51	8	36	−4	22	18	....	1,186	20	76	3.07	−.9	.87	11	8.9	n.	33	nw.	28	10	9	12	....	12.9	5.0	0
New Haven [1]	107	5	39	1,014.6	1,019.3	+1.0	29.5	−1.4	51	8	38	6	22	21	28	1,101	21	70	3.61	−.1	.89	11	9.0	ne.	35	se.	8	9	9	13	5.7	10.2	.6	0
Middle Atlantic							**32.5**	**−2.9**										**71**	**2.75**	**−0.5**											**6.4**			
Albany [1]	97	26	40	1,014.9	1,019.0	+.4	23.9	−1.6	44	8	31	−3	22	17	28	1,277	18	78	1.84	−.8	.55	11	10.0	w.	42	w.	28	6	12	13	6.4	10.1	3.6	0
Binghamton [2]	871	60	79	986.8	1,020.7	+1.7	25.2	−3.0	46	8	32	−6	22	18	32	1,233	18	80	3.55	+1.2	.75	16	6.8	w.	24	w.	28	4	7	20	7.7	22.9	5.0	0
New York	314	415	454	1,007.5	1,020.0	+1.0	32.4	−2.6	55	8	39	12	22	26	22	1,010	21	62	3.16	−.5	1.01	11	17.2	w.	54	nw.	28	10	8	13	5.7	5.9	.1	0
Harrisburg [1]	374	30	49	1,006.4	1,020.7	+.7	29.6	−3.1	55	5	36	2	22	23	31	1,097	21	72	3.61	+.6	1.05	11	8.6	w.	34	nw.	28	6	8	17	6.7	10.2	2.3	0
Philadelphia [1]	114	6	56	1,016.3	1,021.0	+1.4	32.2	−2.4	57	8	39	10	22	25	28	1,013	23	74	2.80	−.6	1.25	12	10.0	w.	29	nw.	1	9	6	16	6.0	1.5	.0	0
Reading	323	47	306	1,008.1	1,021.0	....	31.0	−3.2	56	5	34	8	22	24	33	1,049	....	....	3.63	+.1	1.05	12	12.0	w.	38	w.	1	10	6	15	6.1	10.7	4.7	0
Scranton	805	72	104	989.5	1,020.3	+1.0	27.2	−3.5	48	5	33	−1	22	21	29	1,170	....	....	2.33	−.7	.58	11	7.3	sw.	28	nw.	28	7	8	16	6.3	12.0	2.0	0
Atlantic City	52	37	172	1,018.0	1,020.7	+1.4	35.2	−1.2	54	6	42	14	22	28	27	925	26	70	2.36	−1.6	1.29	11	16.7	w.	50	e.	8	13	3	15	5.9	.8	.0	0
Trenton	190	89	107	1,012.9	1,020.3	....	31.8	−2.6	55	8	38	10	22	26	24	1,028	21	68	2.55	−.8	.78	11	9.6	n.	30	ne.	11	8	8	15	6.3	3.5	T	0
Baltimore [2]	123	100	215	1,016.3	1,021.3	+1.0	34.8	−2.4	54	8	41	15	22	28	25	936	23	67	3.83	+.5	1.37	11	10.4	sw.	37	ne.	11	9	7	15	6.2	2.8	1.0	0
Washington [2]	112	56	100	1,016.9	1,021.3	+1.0	34.4	−2.2	57	25	42	16	22	27	30	947	22	64	3.33	.0	1.10	9	8.1	nw.	28	w.	12	8	6	17	8.4	1.9	.8	0
Cape Henry	18	8	54	1,020.3	1,021.3	....	39.6	−4.1	57	26	46	25	15	33	30	787	31	74	1.75	−1.7	.61	9	13.3	n.	33	n.	3	9	11	11	5.6	T	.0	0
Lynchburg	686	144	184	925.6	1,021.7	+1.0	33.5	−6.0	58	25	42	17	15	25	30	980	23	69	1.96	−1.3	.90	8	8.4	n.	28	nw.	12	10	7	14	6.2	1.7	.3	0
Norfolk [2]	91	80	125	1,018.3	1,022.0	+1.7	39.8	−3.3	67	25	47	25	15	33	30	779	30	76	2.43	−.9	1.07	12	10.3	n.	34	w.	12	8	9	14	6.1	.7	.0	0
Richmond	144	11	52	1,015.6	1,021.7	+1.0	37.0	−2.8	66	25	46	20	27	28	35	865	25	69	2.14	−1.2	.90	6	8.7	sw.	40	sw.	12	11	4	16	6.0	T	.0	0
South Atlantic							**43.2**	**−4.2**										**77**	**1.76**	**−1.6**											**5.4**			
Asheville	2,253	77	92	940.4	1,023.4	+2.1	35.9	−1.9	67	25	46	10	15	26	41	904	26	73	2.27	−.9	.95	12	8.6	nw.	25	nw.	16	6	7	18	6.7	6.4	.0	0
Charlotte [2]	778	63	86	943.2	1,022.7	+1.4	39.4	−3.6	62	25	48	22	15	31	27	791	29	79	2.77	−1.1	1.29	11	7.2	sw.	21	sw.	12	11	6	14	6.0	T	.0	0
Greensboro [1]	886	6	56	989.2	1,022.7	....	35.0	....	63	25	45	14	15	25	33	925	26	77	2.19	....	.84	9	8.3	ne.	26	w.	12	8	7	16	6.3	T	.0	0
Hatteras	11	5	50	1,020.7	1,021.3	+1.0	44.2	−5.9	63	25	50	31	3	38	21	644	38	83	3.56	−.6	2.17	8	15.4	n.	40	w.	12	11	9	11	5.4	T	.0	0
Raleigh [1]	376	5	69	1,008.1	1,022.7	+1.7	38.2	−4.8	67	25	47	21	3	29	29	834	28	76	2.22	−1.4	1.11	9	7.8	sw.	31	sw.	12	13	7	11	5.3	.0	.0	0
Wilmington	72	73	107	1,019.6	1,022.7	+1.7	43.7	−5.4	72	25	54	23	15	34	33	662	33	74	2.98	+.2	1.88	8	9.2	n.	28	w.	12	16	5	10	4.5	.0	.0	0
Charleston [2]	48	11	92	1,021.0	1,023.0	+2.0	46.4	−5.3	68	26	54	28	3	38	25	577	35	81	.92	−1.8	.66	4	9.8	n.	31	w.	11	15	4	12	4.8	.0	.0	0
Columbia, S. C. [2]	347	70	91	1,009.8	1,023.0	+1.7	42.8	−4.4	69	25	53	21	15	33	31	682	32	76	.91	−2.1	.48	8	7.9	ne.	30	w.	11	12	8	11	5.0	.0	.0	0
Greenville, S. C. [1]	1,040	18	36	983.7	1,022.7	....	39.4	−2.8	66	24	48	19	15	30	29	703	29	74	1.91	−2.9	.99	10	8.2	ne.	35	ne.	7	13	2	16	5.8	T	.0	0
Augusta [2]	182	62	77	1,015.9	1,023.0	+1.7	44.2	−3.9	74	31	54	22	15	34	30	643	31	67	.97	−2.3	.43	6	5.8	nw.	24	w.	12	9	8	14	5.8	.0	.0	0
Savannah [2]	65	73	152	1,020.7	1,023.7	+2.7	49.0	−3.4	74	26	59	26	15	39	28	494	36	80	.50	−2.4	.34	3	10.5	w.	41	nw.	11	16	6	9	4.4	T	.0	0
Jacksonville [2]	43	86	110	1,021.7	1,023.7	+3.0	51.9	−4.4	76	31	61	28	15	43	30	406	42	84	.31	−2.7	.24	3	8.1	ne.	30	w.	11	12	12	7	4.5	.0	.0	0
Florida Peninsula							**63.9**	**−2.9**										**81**	**1.48**	**−0.4**											**4.8**			
Key West [2]	21	10	64	1,020.0	1,020.7	+2.1	68.0	−2.3	79	28	72	53	15	64	15	21	60	80	1.88	+.2	1.00	8	10.4	ne.	33	nw.	11	11	13	7	5.0	.0	.0	.0
Miami [2]	25	242	249	1,020.0	1,021.3	+1.7	65.0	−4.1	76	11	71	38	15	59	27	82	55	84	2.37	+.4	2.32	2	13.1	e.	34	nw.	11	11	15	5	4.8	.0	.0	1
Tampa [1]	35	6	43	1,021.3	1,022.7	+2.7	58.8	−2.3	81	23	69	33	15	48	30	224	48	78	.20	−1.9	.16	3	9.2	n.	38	sw.	11	14	10	7	4.6	.0	.0	0
East Gulf							**47.8**	**−2.0**										**79**	**2.97**	**−1.9**											**5.9**			
Atlanta [1]	1,173	33	72	980.0	1,023.4	+2.1	41.2	−3.0	69	24	49	20	15	33	30	741	30	69	2.61	−2.2	1.69	11	11.4	nw.	39	nw.	11	10	4	17	6.5	T	.0	0
Macon [2]	379	79	87	1,009.1	1,023.4	+2.1	45.2	−2.3	74	31	55	22	15	35	33	615	34	74	1.62	−2.4	1.06	8	6.6	nw.	24	sw.	18	10	8	13	5.8	T	.0	0
Thomasville	278	49	58	1,013.2	1,023.4	+2.4	50.5	....	78	30	63	27	15	38	37	451	....	....	.78	−3.	5.53	3	....	....	....	....	....	11	9	11	....	.0	.0	0
Apalachicola	35	11	51	1,021.7	1,023.0	....	51.0	−2.0	70	31	59	30	3	43	23	433	44	82	1.29	−3.	8.95	8	7.7	e.	28	nw.	11	14	4	13	4.9	.0	.0	0
Pensacola	56	54	79	1,021.0	1,023.4	+2.4	52.9	−1.1	73	30	61	29	12	45	28	386	44	80	2.19	−2.5	1.32	8	7.5	e.	24	se.	6	12	11	8	4.7	.0	.0	0
Anniston	741	9	....	....	....	....	43.9	−1.3	70	31	53	19	15	35	35	654	....	....	3.23	−1.8	1.17	10	....	nw.	....	....	....	10	5	16	....	1.3	.0	0
Birmingham [1]	700	5	62	997.0	1,023.0	+1.7	43.1	−1.0	70	31	53	18	2	33	35	681	35	80	4.46	....	1.45	13	8.6	n.	33	e.	7	9	5	17	6.3	1.5	.0	1
Mobile [2]	57	86	161	1,021.0	1,023.0	+2.0	51.4	−.8	73	24	61	28	15	942	31	423	42	82	2.39	−2.6	1.67	8	6.6	s.	21	nw.	11	10	4	17	6.1	T	.0	1
Montgomery [2]	218	92	108	1,015.2	1,023.4	+2.1	48.8	−.6	73	24	58	25	15	40	29	504	38	83	2.84	−2.0	1.40	11	7.3	e.	22	w.	11	12	5	14	5.4	.1	.0	1
Meridian [2]	378	67	92	1,009.1	1,023.0	+1.7	45.4	−2.3	74	25	56	22	15	35	34	612	38	84	6.50	+1.3	3.54	10	6.6	e.	21	sw.	31	11	5	15	5.9	T	.0	2
Vicksburg [2]	247	82	102	1,013.2	1,022.7	+1.7	46.0	−4.0	73	25	55	23	14	37	31	536	35	80	6.84	+1.5	1.72	13	9.3	se.	30	s.	31	12	2	17	6.1	.0	.0	1
New Orleans [4]	53	50	84	1,020.3	1,022.4	+2.1	54.1	−.5	78	31	62	34	15	46	30	347	46	80	2.40	−2.4	1.79	6	6.9	se.	21	nw.	11	10	7	14	5.7	.0	.0	1
West Gulf							**48.5**	**−2.8**										**81**	**5.62**	**+2.4**											**6.3**			
Shreveport	249	5	64	1,013.2	1,022.4	+2.1	44.8	−3.3	71	25	54	24	12	35	40	630	37	82	8.98	+4.7	3.22	13	9.7	nw.	30	ne.	21	11	4	16	6.2	.0	.0	3
Fort Smith	463	57	82	1,005.4	1,022.4	+2.1	38.0	−4.1	66	20	46	19	12	31	32	835	32	80	4.36	+1.6	1.67	11	8.3	e.	19	nw.	11	10	2	19	6.5	T	.0	0
Little Rock [1]	357	20	58	1,009.8	1,023.0	+2.3	38.0	−6.2	64	20	46	20	22	30	40	834	31	80	8.33	+4.2	2.20	11	8.6	ne.	26	nw.	11	11	4	16	6.1	T	.0	3
Austin [1]	605	10	41	1,000.0	1,022.0	....	48.0	−3.0	73	17	57	28	11	39	38	526	40	76	5.91	+3.2	3.89	12	9.0	n.	29	nw.	31	9	6	16	6.2	.0	.0	4
Brownsville [1]	57	5	84	1,018.3	1,020.3	....	60.9	−.3	80	25	71	34	11	51	35	171	52	78	1.65	−.2	1.20	7	10.3	nw.	30	nw.	10	7	3	21	7.1	.0	.0	1
Corpus Christi [1]	20	4	33	1,020.7	1,021.3	+1.3	56.2	−.3	77	24	66	32	11	47	31	296	48	84	2.03	....	1.22	7	11.0	se.	36	nw.	31	8	8	15	6.3	.0	.0	1
Dallas [1]	512	5	45	1,003.4	1,022.4	....	44.2	−3.5	71	15	54	22	22	35	39	647	35	77	4.00	+1.6	1.21	10	10.3	nw.	28	nw.	9	14	2	15	5.4	.0	.0	1
Fort Worth [1]	679	35	56	998.0	1,023.0	+3.0	44.2	−2.3	70	17	53	25	22	35	33	647	34	74	3.60	+1.7	.80	9	11.6	nw.	34	nw.	21	13	5	13	5.4	T	.0	1
Galveston [2]	54	106	114	1,019.6	1,021.7	+1.7	55.1	−1.3	71	25	61	35	11	49	28	306	50	86	6.46	+2.7	3.32	11	11.4	s.	32	nw.	31	7	5	19	6.8	.0	.0	2
Houston [2]	138	157	190	1,016.6	1,022.4	....	52.8	−1.6	77	25	62	30	11	44	28	380	46	85	5.03	+.8	2.02	12	10.9	nw.	28	nw.	31	7	6	18	6.7	T	.0	4
Palestine	510	64	72	1,003.7	1,022.0	+2.0	46.4	−3.5	69	17	55	27	12	38	30	581	38	78	8.44	+4.8	3.52	13	7.9	nw.	21	se.	4	12	5	14	6.0	.0	.0	2
Port Arthur	34	59	134	1,020.7	1,021.7	....	52.4	−2.3	74	25	60	31	11	44	28	391	45	88	6.54	+1.3	2.18	8	13.6	s.	54	se.	4	7	5	19	6.7	.0	.0	2
San Antonio [1]	693	8	51	997.0	1,022.0	+2.4	49.0	−4.7	73	17	59	28	19	38	38	498	41	80	4.16	+2.6	2.89	13	9.0	ne.	37	nw.	31	8	7	16	6.5	.0	.0	2

See footnotes at end of table.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station	Pressure: Sea level	Pressure: Departure from normal	Temperature of the air: Mean	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Total degree days	Mean temperature of the dewpoint	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	°*F.*	°*F.*	°*F.*		°*F.*	°*F.*		°*F.*	°*F.*		°*F.*	%	*In.*	*In.*	*In.*		*Mi.*								*0–10*	*In.*	*In.*	
Ohio Valley and Tennessee					30.8	−4.6												83	4.99	+1.4											7.4			
Chattanooga [1]	762	6	66	994.6	1,023.0	+1.7	38.5	−2.4	61	31	47	15	15	30	36	825	32	82	6.04	+.9	1.66	12	7.5	s.	29	nw.	11	9	5	17	6.7	T	.0	0
Knoxville [1]	995	27	53	985.8	1,023.0	+2.7	37.2	−1.8	68	31	45	15	15	30	31	863	30	90	4.71	+.2	1.26	15	7.0	sw.	34	sw.	31	7	6	18	7.1	3.9	.0	0
Memphis [4]	399	5	86	1,007.8	1,022.7	+1.7	37.8	−4.6	62	20	46	17	22	29	33	845	30	79	11.97	+7.5	3.60	15	8.3	e.	24	nw.	31	11	2	18	6.4	T	.0	1
Nashville [1]	546	5	72	1,002.4	1,022.7	+1.7	36.1	−4.9	61	31	44	19	1	28	35	896	30	82	7.10	+2.9	2.35	11	8.6	s.	30	nw.	25	8	2	21	7.3	3.4	.0	0
Lexington [1]	989	4	28	985.1	1,022.7	+2.0	30.6	−5.2	57	25	39	9	19	22	39	1,067	26	84	5.00	+1.2	1.95	12	----	w.	----	------	----	6	5	20	7.3	5.4	.0	0
Louisville [2]	525	106	120	1,003.1	1,023.0	+2.3	32.0	−5.6	56	20	38	16	22	26	34	1,023	24	76	3.91	+.2	1.41	10	8.9	w.	32	s.	15	7	5	19	7.2	2.7	.0	0
Evansville [1]	431	11	40	1,006.8	1,023.0	+2.7	30.1	−4.7	57	20	37	8	22	23	33	1,084	24	81	3.96	+.4	1.34	12	8.1	nw.	22	sw.	20	6	4	21	7.3	3.0	T	0
Indianapolis [1]	823	5	54	990.9	1,022.4	+2.4	25.3	−5.6	47	5	32	0	26	18	28	1,232	22	86	1.11	------	.43	6	9.9	nw.	30	w.	27	6	5	20	7.3	5.1	.4	0
Terre Haute [2]	575	68	149	1,001.4	1,023.4	------	27.0	−6.5	49	20	34	−1	26	20	25	1,185	22	84	1.12	−1.8	.47	12	9.2	w.	25	w.	15	8	3	20	7.2	3.7	.2	0
Cincinnati [3]	627	11	51	998.6	1,022.7	+2.4	29.2	−4.2	52	5	36	10	22	22	32	1,110	24	81	3.76	+.8	1.20	13	7.4	w.	22	sw.	20	6	5	20	7.3	8.2	T	0
Columbus [2]	822	90	110	990.9	1,022.0	+2.0	27.8	−4.6	52	5	34	5	22	21	29	1,155	22	85	3.53	+.8	.95	11	9.1	s.	31	w.	27	5	3	23	8.0	4.2	.1	0
Dayton [1]	1,003	6	55	984.1	1,022.4	------	25.7	−5.6	52	5	33	5	26	19	29	1,221	21	85	1.94	−.8	.52	11	11.0	nw.	31	nw.	12	5	6	20	7.9	6.2	.2	0
Elkins [1]	1,947	4	45	949.5	1,022.0	+2.0	28.0	−3.7	56	25	38	0	22	18	45	1,147	24	87	5.16	+1.7	1.08	20	7.2	w.	40	nw.	27	3	4	24	8.0	26.6	T	0
Parkersburg	637	77	84	998.0	1,022.4	+1.7	29.8	−5.4	54	5	37	7	22	22	37	1,091	25	84	5.51	+2.5	1.78	17	6.4	sw.	23	w.	27	7	3	21	7.6	16.3	T	0
Pittsburgh [1]	842	39	54	989.2	1,020.7	+1.1	27.6	−4.4	54	5	35	7	22	20	32	1,161	22	84	6.18	+3.3	2.22	17	10.8	sw.	40	w.	27	3	6	22	7.9	26.0	.4	0
Lower Lakes					24.1	−4.4												83	3.16	+0.4											8.1			
Buffalo [1]	768	34	96	989.8	1,019.3	+1.3	25.4	−3.4	47	5	32	0	22	19	29	1,228	20	82	3.83	+.5	1.20	17	14.0	w.	39	sw.	17	1	12	18	8.1	35.1	12.0	0
Canton	448	10	61	1,001.0	1,018.6	------	17.0	−4.8	42	5	26	−24	29	7	38	1,489	14	90	2.98	+.3	.94	16	8.3	w.	32	e.	12	4	10	17	7.1	28.8	17.8	0
Oswego	335	71	85	1,005.8	1,019.0	+1.0	25.8	−3.2	42	7	31	1	29	20	23	1,218	18	72	3.76	+.3	1.48	19	11.6	se.	34	ne.	12	3	4	24	8.1	29.3	7.7	1
Rochester [1]	523	5	69	999.0	1,019.6	+1.6	23.2	−4.6	45	5	30	−3	21	16	32	1,295	18	82	5.05	+2.3	1.59	19	11.1	sw.	40	w.	28	2	6	23	8.3	41.8	12.5	0
Syracuse [1]	596	5	57	995.9	1,019.0	+.7	23.8	−3.6	43	6	31	−7	3	16	36	1,279	18	84	5.00	+1.9	1.08	20	10.5	sw.	32	w.	28	1	5	25	8.4	46.1	14.5	0
Erie [2]	714	57	81	992.9	1,020.7	+2.4	28.8	−3.1	47	5	34	9	27	24	22	1,124	23	83	4.69	+1.9	2.36	21	9.3	s.	26	ne.	12	0	6	25	8.7	53.6	9.8	0
Cleveland [1]	762	27	54	991.9	1,021.3	+2.3	25.6	−3.5	52	5	33	−5	27	18	34	1,223	21	82	2.43	.0	.83	19	11.1	sw.	32	n.	12	1	6	24	8.5	28.9	7.4	0
Sandusky	629	5	67	997.0	1,021.7	+2.7	26.0	−5.2	52	5	32	1	26	20	21	1,208	----	----	2.29	.0	.86	18	9.2	w.	29	nw.	12	4	3	24	7.9	13.9	4.0	0
Toledo [1]	628	5	47	997.3	1,022.0	+3.4	22.6	−6.5	50	5	31	−13	26	14	35	1,315	20	86	1.64	−.7	.47	13	10.4	w.	28	s.	15	5	4	22	7.7	16.7	6.5	0
Fort Wayne [1]	857	5	33	988.8	1,021.3	------	22.0	−6.6	45	5	30	−6	22	14	32	1,334	20	88	1.73	−.8	.82	14	8.0	w.	25	w.	27	3	6	22	8.0	15.5	5.0	0
Detroit [1]	730	5	78	992.9	1,021.3	+3.0	24.8	−4.1	47	5	31	3	26	19	24	1,250	20	80	1.34	−1.0	.56	15	10.1	nw.	28	n.	12	3	4	24	8.0	11.8	6.0	0
Upper Lakes					20.7	−2.7												81	1.24	−0.8											7.6			
Alpena	609	5	89	995.3	1,019.3	+2.7	23.0	−1.8	39	6	29	2	24	18	24	1,298	19	85	.78	−1.3	.39	17	10.8	nw.	28	nw.	20	2	8	21	7.8	9.7	3.9	0
Escanaba	612	51	72	995.9	1,020.0	+3.1	20.2	−2.2	37	3	27	−10	26	14	26	1,390	16	84	.67	−1.1	.21	10	10.2	sw.	27	nw.	27	6	9	16	6.7	7.6	7.1	0
Grand Rapids [2]	707	70	244	993.6	1,020.7	+3.1	25.6	−2.9	40	6	31	4	24	20	23	1,219	20	85	1.26	−1.3	.38	10	10.6	s.	32	sw.	16	0	5	26	8.7	21.9	5.2	0
Lansing [2]	878	5	90	987.1	1,021.0	------	21.9	−5.3	43	5	29	−3	24	15	29	1,335	18	81	1.61	−.5	.81	12	8.3	w.	25	sw.	20	3	4	24	8.2	17.1	6.7	0
Marquette	734	44	73	989.8	1,018.6	+2.0	21.4	−1.2	38	7	27	−2	25	16	23	1,347	15	75	2.06	−.6	.43	20	9.8	w.	29	sw.	3	4	2	25	8.4	24.4	12.4	0
Sault Sainte Marie [1]	614	11	52	994.2	1,018.0	+2.1	19.2	+.4	41	6	26	−11	21	12	26	1,420	16	88	2.82	+.6	.57	22	11.4	s.	37	nw.	27	1	5	25	8.6	36.4	18.2	0
Chicago [1]	673	5	36	996.3	1,022.4	+3.8	22.0	−4.9	42	4	29	−7	26	15	26	1,336	16	79	1.10	−1.0	.54	11	9.9	s.	24	n.	12	6	6	19	7.1	15.8	5.0	0
Green Bay	617	90	123	997.0	1,021.0	+3.7	19.0	−3.3	37	3	26	−9	26	12	24	1,426	12	70	.65	−1.1	.38	7	10.9	sw.	28	s.	3	6	5	20	7.1	8.9	1.6	0
Milwaukee [1]	681	33	66	994.9	1,021.7	+3.7	19.8	−4.9	37	3	27	−8	24	12	30	1,403	14	76	1.14	−.6	.36	10	12.7	nw.	30	sw.	16	4	9	18	7.3	12.5	3.2	0
Duluth [2]	1,133	5	47	976.3	1,019.6	+2.0	15.2	−.7	34	7	23	−17	21	7	32	1,545	10	86	.35	−.8	.11	11	12.7	nw.	46	nw.	8	9	6	16	6.5	2.1	2.2	0
North Dakota					15.8	+3.9												82	0.66	−0.5											6.1			
Fargo [1]	940	5	43	984.8	1,021.3	+2.7	14.6	+3.1	40	14	25	−14	21	5	35	1,560	12	87	.19	−.5	.06	9	13.0	s.	34	n.	15	7	9	15	6.5	3.1	1.4	0
Bismarck [1]	1,677	5	43	958.3	1,022.0	+3.4	17.8	+5.0	45	6	27	−9	31	8	29	1,464	12	80	T	−.6	T	0	10.9	nw.	35	nw.	15	12	5	14	5.6	T	T	0
Devils Lake	1,478	11	44	964.4	1,021.3	+3.3	13.4	+3.9	41	6	22	−15	25	5	31	1,602	8	81	.11	−.4	.05	6	9.3	nw.	24	nw.	7	8	10	13	6.3	1.8	2.6	0
Grand Forks [1]	832	4	41	988.8	1,021.0	------	13.6	------	38	6	23	−15	25	4	36	1,596	10	---	.23	------	.17	5	----	n.	----	------	----	9	7	15	----	3.1	1.4	0
Williston	1,878	42	50	951.2	1,021.3	+3.3	17.4	+3.6	45	14	26	−14	31	8	28	1,475	12	81	.03	−.6	.01	3	6.9	nw.	25	nw.	31	8	9	14	6.0	.4	.1	0
Upper Mississippi					22.4	−4.1												81	1.52	−0.2											6.8			
Minneapolis - St. Paul [1]	919	43	74	985.8	1,021.0	+2.4	19.3	−.3	37	16	27	−10	21	12	31	1,417	14	80	.09	−.9	.03	4	11.9	nw.	34	nw.	15	10	4	17	6.5	1.1	.5	0
Springfield, Minn.	1,025	4	42	983.1	1,022.0	------	19.8	------	39	14	28	−7	21	12	33	1,401	14	76	.04	------	.02	3	----	nw.	----	------	----	12	5	14	----	1.6	.1	0
La Crosse [1]	714	5	29	994.2	1,021.7	+3.1	19.0	−1.4	38	7	26	−10	26	12	29	1,426	15	82	.59	−.7	.20	7	10.1	s.	26	nw.	15	6	7	18	6.9	4.8	2.7	0
Madison [2]	974	70	78	984.4	1,022.0	+3.4	18.6	−4.2	36	4	25	−8	26	12	23	1,436	13	78	1.34	−.3	.37	12	9.1	nw.	31	ne.	10	6	7	18	7.0	16.1	8.3	0
Charles City	1,015	10	51	984.4	1,023.4	+4.1	17.8	−2.6	36	7	26	−14	26	10	31	1,461	----	----	1.28	.0	.30	10	6.8	nw.	28	nw.	15	8	6	17	6.4	10.2	5.6	0
Davenport [1]	606	6	50	999.7	1,023.7	+4.4	20.2	−5.5	41	4	28	−10	26	12	31	1,391	17	83	1.54	+.1	.63	10	9.2	nw.	29	nw.	15	5	7	18	6.9	13.9	2.9	0
Des Moines [2]	860	5	99	990.5	1,023.4	+3.8	21.6	−4.4	38	7	29	−4	26	15	28	1,344	17	86	1.70	+.5	.70	10	9.9	n.	27	nw.	15	5	13	13	6.3	13.8	2.5	0
Dubuque	699	60	79	996.3	1,023.4	+4.1	20.6	−4.1	39	7	28	−12	26	14	24	1,377	16	79	1.42	−.0	.43	14	5.8	nw.	19	nw.	15	8	6	17	6.6	14.8	4.8	0
Burlington [1]	702	4	36	996.6	1,023.4	+3.4	21.1	−6.2	43	4	29	−6	18	13	30	1,361	17	82	1.21	−.4	.40	9	10.6	nw.	38	nw.	15	4	6	21	7.3	11.0	1.6	0
Cairo	357	5	99	1,009.8	1,023.4	+2.4	33.6	−4.2	59	20	40	13	22	28	27	967	----	----	4.89	+1.5	1.90	12	8.6	ne.	26	sw.	20	8	4	19	6.9	.6	.0	0
Peoria [1]	609	6	26	1,000.0	1,023.7	+4.1	22.2	−4.9	40	4	29	−5	26	15	26	1,328	18	85	.90	−.9	.31	7	9.1	nw.	27	nw.	15	8	9	14	6.2	8.3	2.9	0
Springfield, Ill. [3]	636	5	191	999.0	1,023.4	+3.4	25.6	−6.1	47	4	32	0	26	19	26	1,224	20	88	1.71	−.5	.75	8	10.7	s.	27	nw.	15	6	8	17	7.0	14.5	2.5	0
St. Louis [5]	568	35	303	1,002.0	1,023.4	+3.1	29.2	−5.7	55	20	35	6	26	23	24	1,106	22	76	1.52	−.7	.52	8	10.5	nw.	24	nw.	11	5	8	18	7.1	6.5	T	0
Missouri Valley					25.6	−2.6												81	1.76	+0.6											6.2			
Columbia, Mo. [2]	784	6	66	993.9	1,023.7	+3.7	27.2	−6.8	48	20	34	3	26	20	31	1,172	20	74	1.58	−.3	.62	8	7.7	s.	21	nw.	15	4	9	18	7.5	7.3	T	0
Kansas City [1]	963	39	76	987.5	1,024.0	+2.4	28.2	−4.3	46	8	35	9	26	22	27	1,142	22	76	3.74	+2.5	2.19	8	9.7	nw.	26	nw.	31	6	8	17	6.7	7.5	T	0
St. Joseph [2]	967	11	49	987.5	1,023.7	------	26.4	−3.2	43	20	33	2	26	20	26	1,194	21	84	4.57	+3.3	2.39	10	8.2	nw.	23	nw.	15	11	9	11	5.4	7.5	T	0
Springfield, Mo. [1]	1,324	5	67	973.6	1,022.7	+2.4	29.8	−5.7	60	20	38	9	12	22	33	1,088	25	84	.91	−1.4	.61	11	11.6	s.	29	n.	21	7	3	21	7.1	3.0	T	0
Topeka	967	65	87	986.5	1,023.4	------	29.0	−3.0	48	8	36	8	26	22	29	1,118	23	80	5.08	+4.1	3.44	8	8.2	n.	22	n.	21	10	5	16	6.2	5.7	.0	0
Lincoln [3]	1,189	11	81	979.0	1,023.7	+3.7	26.4	−1.2	47	6	34	1	19	29	1,194	21	86	.60	−.2	.29	11	8.8	n.	29	nw.	15	8	8	15	6.3	5.3	T	0
Omaha [1]	1,105	5	68	982.1	1,024.0	+4.4	23.5	−2.9	42	14	31	−4	1	16	32	1,289	19	84	.47	−.5	.19	6	11.2	s.	34	nw.	15	10	8	13	6.2	4.9	T	0
Valentine	2,598	46	54	927.2	1,022.7	+3.4	22.9	−1.7	47	16	33	−6	23	13	30	1,304	18	80	.14	−.5	.14	1	9.0	w.	27	sw.	28	10	11	10	5.5	2.3	.5	0
Sioux City [1]	1,138	5	40	980.0	1,023.4	+3.4	21.7	+.1	44	16	31	−12	25	12	33	1,342	17	82	.38	−.5	.23	5	10.3	nw.	31	nw.	15	10	8	13	5.8	4.9	1.0	0
Huron [1]	1,301	5	41	973.2	1,022.7	+3.4	21.1	+2.4	50	6	32	−6	25	11	35	1,358	16	83	.11	−.5	.08	3	12.8	s.	36	s.	2	13	5	13	5.1	1.2	.7	0

See footnots at end of table.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS

District and station	Elevation of instruments: Barometer above sea level	Thermometer above ground	Anemometer above ground	Pressure: Station	Sea level	Departure from normal	Temperature of the air: Mean	Departure from normal	Maximum	Date	Mean maximum	Minimum	Date	Mean minimum	Greatest daily range	Total degree days	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Departure from normal	Greatest in 24 hours	Days with 0.01 inch or more	Wind: Average hourly velocity	Prevailing direction	Maximum velocity: Miles per hour	Direction	Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	Ft.	Ft.	Mbs.	Mbs.	Mbs.	°F.	°F.	°F.		°F.	°F.		°F.	°F.		°F.	%	In.	In.	In.		Mi.								0–10	In.	In.	
Northern Slope							22.1	−1.3										79	0.52	−0.2											6.3			
Billings [1]	3,570	16	40	894.7	1,022.7	----	26.8	+.6	57	6	37	−17	23	17	31	1,189	18	71	1.17	----	.47	9	12.3	sw.	32	ne.	31	7	7	17	6.5	18.2	7.0	0
Havre	2,507	11	67	930.9	1,024.0	+6.4	20.0	−.4	52	5	30	−17	31	10	30	1,396	15	82	.16	−.4	.07	4	8.4	sw.	42	sw.	6	4	9	18	6.9	3.1	.9	0
Helena [1]	4,124	5	43	878.1	1,028.4	+8.1	16.0	−6.7	54	6	27	−26	23	5	31	1,526	10	80	.37	−.1	.16	8	5.1	w.	27	w.	6	5	8	18	6.9	12.4	6.0	0
Missoula [1]	3,205	4	32	908.9	1,028.4	----	19.6	−1.8	51	6	27	−19	24	12	27	1,404	18	93	1.05	----	.35	12	4.2	se.	29	s.	22	0	4	27	9.0	19.2	5.0	0
Kalispell	2,973	48	56	918.7	1,026.1	+7.8	23.6	−1.3	51	6	28	−7	23	19	22	1,285	20	86	.63	−.8	.25	13	3.9	nw.	17	sw.	6	1	4	26	8.8	5.3	4.2	0
Miles City [1]	2,371	5	78	935.7	1,023.4	+4.1	21.9	----	55	6	34	−19	31	10	36	1,333	16	82	.24	----	.16	4	----	w.	----	----	----	6	10	15	6.5	3.0	3.0	0
Rapid City [1]	3,259	5	63	903.8	1,022.4	+3.4	25.7	+.6	60	6	37	−7	23	14	39	1,220	16	76	.37	−.1	.15	5	14.8	nw.	54	nw.	15	13	8	10	5.0	7.0	2.9	0
Cheyenne [1]	6,094	5	40	813.4	1,023.0	+4.0	27.3	−1.2	54	6	40	−1	23	14	40	1,171	16	66	.55	.0	.27	7	12.3	nw.	34	nw.	19	14	7	10	4.9	7.3	T	0
Lander	5,352	60	68	837.8	1,028.4	+7.4	10.9	−9.5	43	6	23	−22	26	−1	36	1,678	4	76	.55	−.1	.32	4	2.9	sw.	19	ne.	22	17	8	6	4.1	7.8	10.8	0
Sheridan [1]	3,790	5	38	887.2	1,024.0	----	23.8	+1.0	55	5	37	−24	23	10	41	1,279	15	75	1.28	+.6	.39	7	6.7	nw.	40	w.	31	10	11	10	5.4	11.8	6.8	0
North Platte [2]	2,821	11	51	919.7	1,023.0	+3.7	27.7	+1.0	54	14	37	3	21	18	31	1,155	20	82	.24	−.3	.11	5	7.5	n.	24	nw.	15	9	8	14	5.6	3.9	T	0
Middle Slope							32.8	−1.2										74	1.42	+0.4											5.4			
Denver [2]	5,292	106	113	839.1	1,022.0	+3.4	32.6	+.3	61	6	44	6	10	21	36	1,001	17	64	.15	−.6	.14	3	7.1	s.	26	nw.	31	11	16	4	4.5	2.4	.0	0
Pueblo [1]	4,690	5	36	859.1	1,022.7	+4.1	31.9	+1.8	67	6	49	4	10	15	55	1,024	14	56	.03	−.5	.02	2	7.4	nw.	35	n.	9	13	11	7	4.4	.8	.0	0
Concordia	1,392	50	58	971.9	1,023.7	+4.1	29.4	−1.3	50	14	37	9	26	22	32	1,099	24	80	.87	+.2	.54	7	7.5	s.	24	nw.	15	11	6	14	5.7	5.9	.0	0
Dodge City [1]	2,509	5	58	931.6	1,022.4	+3.1	31.4	−1.2	59	20	41	8	11	22	34	1,042	24	78	1.16	+.6	.95	5	15.1	nw.	38	nw.	20	12	5	14	5.5	6.5	.0	0
Wichita [1]	1,358	6	64	972.6	1,023.0	+3.4	31.5	−3.1	56	20	38	13	26	24	29	1,037	26	80	3.98	+3.0	2.97	9	13.2	nw.	36	n.	21	10	5	16	6.1	2.6	.0	0
Oklahoma City [2]	1,214	10	47	977.7	1,022.4	+2.8	37.4	−1.9	66	19	45	20	1	30	33	851	30	79	2.30	+.8	1.81	6	9.3	n.	25	n.	9	12	5	14	5.4	T	.0	0
Tulsa [1]	674	10	60	997.6	1,022.7	----	35.6	−3.2	61	20	44	17	12	28	32	913	29	80	1.48	−.4	1.30	6	11.0	n.	33	ne.	21	9	7	15	6.2	T	.0	0
Southern Slope							41.6	−2.0										73	1.20	+0.3											5.2			
Abilene [1]	1,738	4	59	959.0	1,021.3	+1.7	42.8	−2.3	70	20	53	21	22	33	35	689	34	77	1.75	+.4	.77	6	13.4	nw.	41	se.	3	12	5	14	5.6	T	.0	0
Amarillo [1]	3,676	5	42	892.7	1,022.4	+3.4	35.0	−.5	72	20	45	14	1	25	42	930	25	76	1.20	+.4	.93	4	13.6	nw.	45	sw.	19	14	5	12	5.2	2.4	.0	2
Del Rio	960	63	71	987.1	1,021.0	+1.7	50.0	−2.2	71	17	60	27	11	40	32	466	40	74	1.63	+.9	.99	8	8.4	nw.	32	nw.	31	15	4	12	5.3	.0	.0	0
Roswell	3,566	75	85	897.1	1,022.4	+4.1	38.4	−2.8	70	20	51	16	10	25	49	825	24	65	.21	−.4	.14	5	6.0	s.	28	ne.	9	14	9	8	4.7	2.0	.0	0
Southern Plateau							46.2	+2.9										58	1.01	+0.1											4.4			
El Paso [1]	3,778	39	85	889.6	1,019.3	+2.4	44.7	+1.0	64	7	58	23	11	32	37	629	28	54	.48	.0	.48	2	7.6	n.	31	w.	3	16	7	8	4.0	.0	.0	0
Albuquerque [1]	5,314	5	45	840.5	1,020.7	----	36.2	+1.7	56	24	47	16	11	25	33	888	24	64	.76	+.3	.34	5	7.5	n.	33	sw.	3	15	7	9	4.4	1.0	.0	0
Flagstaff	6,907	36	51	792.1	1,022.4	+4.4	32.8	+3.2	61	19	46	−3	31	20	47	1,003	20	64	1.82	−.2	.48	10	----	nw.	----	----	----	16	6	9	4.4	13.5	4.7	0
Phoenix [2]	1,107	39	87	979.3	1,018.6	+1.3	54.0	+2.0	76	18	68	31	31	40	39	340	35	61	1.09	+.1	.93	4	5.5	e.	16	se.	23	10	13	8	4.8	.0	.0	1
Tucson [1]	2,555	5	39	929.2	1,018.0	----	52.3	+1.6	75	1	65	30	31	40	39	392	35	60	1.55	+.6	.77	4	----	se.	----	----	----	11	9	11	4.9	.0	.0	0
Yuma	142	9	54	1,013.5	1,018.0	+.4	57.4	+2.2	75	20	69	39	30	46	30	237	32	44	.35	−.2	.32	2	5.8	n.	20	n.	9	16	10	5	4.0	.0	.0	0
Middle Plateau							31.7	+1.8										73	0.33	−0.6											4.9			
Reno [1]	4,527	20	52	866.6	1,023.7	+2.7	33.4	+1.5	58	7	49	4	30	18	40	978	25	76	.27	−.7	.09	4	3.9	w.	47	sw.	28	10	9	12	5.4	2.1	.2	0
Tonopah	6,090	9	20	816.8	1,021.7	----	34.4	+2.8	50	6	42	18	30	27	21	945	24	66	.04	−.3	.04	2	----	w.	----	----	----	14	10	7	----	2.0	.5	0
Winnemucca	4,339	5	56	873.0	1,025.1	+3.1	30.0	.0	54	22	40	8	13	19	32	1,087	24	78	.53	−.6	.31	7	8.2	ne.	26	sw.	28	9	10	12	5.9	3.4	T	0
Modena	5,473	10	46	837.1	1,023.0	+3.0	29.4	+1.3	56	19	43	2	31	16	40	1,108	----	----	.37	−.5	.27	3	7.3	w.	25	s.	28	16	11	4	3.7	3.5	.9	0
Salt Lake City [1]	4,227	32	58	873.0	1,025.7	+4.7	30.9	+.7	51	1	40	12	18	22	30	1,057	24	81	.51	−.9	.22	4	7.0	se.	31	s.	1	13	7	11	5.1	4.0	1.7	0
Grand Junction	4,602	60	68	864.2	1,022.4	+3.1	32.2	+4.7	50	7	43	10	16	21	34	1,016	20	64	.24	−.4	.07	4	4.6	se.	14	se.	18	16	5	10	4.5	.9	.0	0
Northern Plateau							28.6	−1.4										86	0.80	−0.9											7.8			
Baker [2]	3,471	36	54	902.1	1,027.4	+6.1	27.2	−.1	44	7	36	8	17	18	30	1,173	20	84	.35	−1.4	.12	8	5.0	se.	20	s.	28	9	6	16	6.4	3.8	1.0	0
Boise [1]	2,739	5	49	927.9	1,027.4	+4.7	29.6	−1.3	51	1	35	11	18	23	19	1,114	26	88	1.09	−.5	.43	9	6.5	se.	29	se.	27	4	3	24	7.9	1.3	.0	0
Pocatello [1]	4,478	5	31	868.3	1,027.4	+5.0	23.6	−1.7	42	1	33	3	18	14	33	1,284	20	87	1.03	−.1	.59	8	6.1	sw.	26	n.	22	7	6	18	6.8	5.5	3.5	0
Spokane [1]	1,929	27	42	955.0	1,026.1	+7.3	28.4	−2.1	53	5	34	0	23	23	22	1,134	25	86	1.14	−1.0	.36	9	4.5	sw.	25	ne.	22	4	4	23	8.0	4.4	T	0
Walla Walla	991	57	65	983.1	1,026.8	+6.8	33.4	−2.1	65	5	37	19	23	30	30	983	----	----	.72	−1.3	.22	11	4.4	sw.	21	se.	27	0	7	24	9.1	.4	.0	0
Yakima	1,076	58	67	986.5	1,026.4	----	29.8	−.9	52	5	35	10	24	25	23	1,090	----	----	.44	−.9	.44	4	3.8	nw.	15	ne.	22	3	2	26	8.6	T	.0	0
North Pacific Coast							41.9	+0.2										79	2.71	−4.4											7.1			
North Head	211	5	55	1,011.9	1,019.3	+2.4	45.4	+1.3	59	13	50	32	24	40	16	608	35	68	4.77	−4.7	1.34	15	13.8	e.	55	s.	27	9	6	16	6.0	T	.0	0
Seattle [2]	125	90	321	1,016.9	1,021.3	+5.0	41.9	−.7	59	5	47	25	24	37	21	714	34	81	1.00	−4.6	.22	10	7.3	n.	32	s.	27	7	6	18	6.7	.2	.0	0
Tacoma	194	172	201	1,014.2	1,021.0	+4.7	39.5	−1.1	59	5	44	22	24	35	17	790	----	----	2.13	−4.6	.66	9	5.8	s.	33	s.	27	9	3	19	6.8	T	.0	0
Tatoosh Island	86	9	61	1,016.3	1,019.3	+4.7	45.2	+1.3	59	14	48	34	25	42	13	616	37	74	6.20	−7.2	2.11	16	24.7	e.	62	e.	22	9	4	18	6.4	T	.0	0
Medford [1]	1,329	29	58	973.2	1,021.7	----	39.8	+1.7	62	12	47	23	15	32	38	782	35	84	.74	−2.1	.29	13	----	nw.	----	----	----	2	5	24	8.3	T	.0	0
Portland, Oreg. [2]	154	68	106	1,016.6	1,022.0	+3.7	40.4	−.8	59	5	44	30	26	36	17	762	32	76	2.18	−4.5	.58	14	7.8	e.	22	e.	15	8	4	19	6.8	T	.0	0
Roseburg	510	45	76	1,002.4	1,021.0	+1.4	41.4	−.4	60	4	46	29	13	37	20	727	38	89	1.97	−3.4	.58	15	2.9	nw.	18	se.	27	1	4	26	8.6	.0	.0	0
Middle Pacific Coast							50.3	+2.4										81	4.07	−0.4											6.7			
Eureka	60	72	88	1,018.0	1,020.0	.0	50.6	+2.4	70	12	57	35	30	44	27	447	45	82	5.92	−.4	1.23	13	5.4	se.	27	se.	27	6	4	21	6.9	.0	.0	1
Red Bluff [1]		6	26	1,007.8	1,020.3	----	48.7	+2.6	69	4	58	30	26	39	35	503	40	73	3.80	----	1.77	9	6.5	nw.	34	se.	28	8	6	17	6.8	.0	.0	0
Sacramento	66	92	115	1,018.6	1,020.7	.0	47.8	+1.6	64	22	56	32	12	40	26	532	43	88	2.31	−.7	.78	8	4.9	n.	17	se.	28	8	5	18	6.6	.0	.0	1
San Francisco [2]	155	112	132	1,014.2	1,019.6	−.4	54.2	+2.9	68	12	59	45	30	49	18	337	45	81	3.97	.0	1.31	9	5.1	n.	19	sw.	28	6	9	16	6.5	.0	.0	0
South Pacific Coast							55.2	+2.8										65	1.29	−0.7											5.9			
Fresno [1]	327	5	34	1,008.5	1,020.3	.0	47.4	+2.3	67	20	56	29	13	38	30	543	42	84	1.45	.0	.57	8	3.4	nw.	16	se.	28	6	4	21	7.1	.0	.0	1
Los Angeles	338	223	250	1,007.1	1,018.6	+.3	60.0	+3.4	79	12	69	43	30	51	27	164	36	47	.90	−1.7	.36	4	7.3	ne.	26	e.	10	13	10	8	4.5	.0	.0	2
San Diego [1]	87	20	55	1,015.6	1,018.3	.0	58.2	+2.7	79	11	69	40	31	47	32	208	43	63	1.53	−.3	1.06	4	3.5	n.	18	w.	2	9	6	16	6.1	.0	.0	2
West Indies																																		
San Juan, P. R.	82	10	34	1,011.2	1,014.9	----	76.1	−.2	82	9	79	68	6	73	12	0	69	80	3.28	−2.2	.80	211	5.0	e.	34	e.	23	1	23	7	6.0	.0	.0	0
Panama Canal																																		
Balboa Heights	118	6	92	----	[3]1,009.8	0.0	80.4	+.5	90	8	88	71	29	73	17	0	73	[3]85	4.10	−.7	----	20	5.1	nw.	26	n.	7	2	26	3	5.7	.0	.0	0
Cristobal	27	47	97	----	[3]1,010.5	0.0	80.1	+.1	88	3	84	72	15	76	11	0	74	[3]81	22.36	+10.6	----	26	12.9	ne.	31	nw.	14	8	12	11	5.5	.0	.0	0

See footnotes at end of table.

CLIMATOLOGICAL DATA FOR WEATHER BUREAU STATIONS

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station	Pressure: Sea level	Pressure: Departure from normal	Temperature of the air: Mean	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Total degree days	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Greatest in 24 hours	Precipitation: Days with 0.01 inch or more	Wind: Average hourly velocity	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month	Number of days with thunderstorms
	Ft.	*Ft.*	*Ft.*	*Mbs.*	*Mbs.*	*Mbs.*	°*F.*	°*F.*	°*F.*		°*F.*	°*F.*		°*F.*	*F°.*		°*F.*	%	*In.*	*In.*	*In.*		*Mi.*								*0–10*	*In.*	*In.*	
Alaska																																		
Anchorage [1]	132	5	44	1,004.7	1,009.8	-----	17.3	+4.0	48	16	24	23	5	11	25	1,475	16	88	1.08	+.2	.59	8	4.9	ne.	28	s.	16	2	6	23	8.2	16.2	3.8	0
Fairbanks [1]	454	5	63	995.6	1,013.9	-----	-2.2	+4.9	40	12	7	-46	6	-12	46	2,088	-4	88	.45	-.1	.18	7	5.0	n.	30	e.	30	5	7	19	7.1	7.3	9.0	0
Juneau [1]	80	6	32	1,013.2	1,016.3	-----	31.2	-----	54	12	35	-2	30	27	2.	1,050	28	84	4.43	-----	1.02	20	10.8	se.	34	se.	8	4	4	23	8.0	5.6	2.6	0
Nome	22	25	56	1,006.8	1,007.5	-----	11.1	+3.6	35	21	17	-21	4	5	24	1,670	8	86	1.74	+.6	----	13	12.6	ne.	49	sw.	16	10	5	16	6.2	11.3	10.4	0
Hawaii																																		
Honolulu	38	86	100	-----	-----	-----	----	-----	---	---	---	---	---	---	---	-----	----	----	-----	-----	----	---	-----	-----	---	-----	---	---	---	---	---	---	---	---
Alaska																																		
Bethel	28	7	31	1,003.7	1,005.1	-----	13.4	+6.1	42	23	19	-29	4	8	33	1,589	11	86	.82	.0	----	14	12.8	ne.	39	-----	15	0	6	19	7.1	4.3	1.8	0
Gambell	32	5	32	1,005.4	1,006.4	-----	10.0	+.6	33	21	14	-10	5	6	22	1,705	8	90	1.33	+.6	----	16	24.0	e.	50	e.	29	7	5	19	7.0	13.3	15.2	0
Ketchikan	75	69	90	1,016.6	1,017.3	-----	36.6	+1.3	53	13	41	20	29	33	14	882	32	86	13.08	+2.9	2.82	17	5.3	ne.	23	e.	10	6	4	21	7.6	11.8	7.8	0
Kotzebue	20	5	31	1,010.5	1,011.2	-----	2.0	+5.7	34	16	9	-36	5	-5	32	1,952	0	88	.76	+.5	.40	8	15.0	e.	52	se.	21	7	10	14	6.4	6.7	12.0	0
McGrath	331	5	31	997.6	1,010.5	-----	-.6	-----	44	15	8	-51	5	-9	34	2,034	-2	90	1.48	+.2	.39	16	----	nw.	---	-----	---	7	6	18	6.7	17.0	14.6	0
Northway	1,718	5	32	950.9	1,018.0	-----	-7.3	-----	30	11	0	-49	30	-15	26	2,245	-10	84	.26	-----	.21	5	3.5	se.	24	-----	4	5	5	21	7.5	3.0	8.5	0

[1] Data are airport records.
[2] Barometric data (adjusted to old city elevation) and hygrometric data from airport; otherwise city office records.
[3] Observations taken hourly.
[4] Pressure (adjusted to old city elevation), temperature, and hygrometric data from airport; otherwise city office records.
[5] Temperature and precipitation from city records, other data from airport.

NOTE.—Except as indicated by notes [1], [2], [4], and [5], data in table are city office records.

SEVERE LOCAL STORMS, DECEMBER 1944

NOTE.—The data for December will be published in the January 1945 issue of the REVIEW.—EDITOR.

SOLAR RADIATION AND SUNSPOT DATA FOR DECEMBER 1944

[Solar Radiation Investigations Section, I. F. HAND, in charge]

SOLAR RADIATION OBSERVATIONS

EXPLANATIONS of the tables and references to descriptions of instruments, stations, and methods of observation, and to summaries of data, are given in the January 1944 REVIEW, page 43. A list of the pyrheliometric stations also is given on page 45 of the same REVIEW.

Eight stations had less than average solar radiation for 1944, while four received more than normal insolation during the same period. Mr. R. A. Dyke, Official in Charge of the Weather Bureau Office at Lincoln, attributes the rather large minus departure at his station to less than normal sunshine. Almost unquestionably the transfer of the radiation equipment from the University Experiment Station to the heart of the business district also is a contributing cause of the diminished radiation receipt.

TABLE 1.—*Solar radiation intensities during December 1944*

[Gram-calories per minute per square centimeter of normal surface]

MADISON, WIS.

Date	Sun's zenith distance: 7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0. 0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass: A. M.				*1.0	P. M.				Local mean solar time
	e	5.0	4.0	3.0	2.0		2.0	3.0	4.0	5.0	e
	mb.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*
Dec. 2	1.6	0.90	1.11	1.18	.....	1.48	.....	1.16	.....	.....	2.7
Dec. 12	2.6	.75	1.02	1.19	.....	1.61	.....	.....	.....	.....	3.0
Dec. 14	1.4	.71	.84	1.07	.....	.....	.....	.....	.....	.....	2.6
Dec. 15	3.5	.74	.91	.99	.....	.....	.....	.....	.....	.....	5.1
Dec. 19	1.7	.88	.90	1.15	.....	1.45	.....	.....	.....	.....	2.9
Dec. 21	1.0	.98	1.13	1.24	.....	1.61	.....	.....	.....	.....	1.0
Dec. 23	1.9	.76	.94	1.06	.....	.....	.....	.....	.....	.....	1.0
Dec. 26	0.4	.69	.94	1.10	.....	1.58	.....	.....	.....	.....	1.1
Means	.....	**.80**	**.97**	**1.12**	.....	**1.55**	.....	**(1.16)**	.....	.....	.....
Departures	.....	**−.13**	**−.09**	**−.06**	.....	**+.01**	.....	**−.04**	.....	.....	.....

LINCOLN, NEBR.

Dec. 1	1.0	.....	.....	0.47	.....	.....	.....	1.16	0.98	0.81	2.7
Dec. 5	5.3	.....	.....	.....	.....	.....	.....	.94	.83	.70	5.3
Dec. 6	4.6	.....	0.83	1.05	.....	.....	.....	.....	.....	.....	6.6
Dec. 7	5.6	0.96	1.09	1.22	.....	.....	.....	1.20	1.05	.83	5.3
Dec. 10	3.5	.....	.....	.....	.....	.....	.....	1.18	1.05	.94	3.3
Dec. 13	3.2	.....	1.21	1.27	.....	.....	.....	1.22	1.09	1.01	3.5
Dec. 14	4.2	.90	.98	1.16	.....	.....	.....	1.20	1.01	.....	5.6
Dec. 16	3.5	.98	1.13	1.22	.....	.....	.....	1.27	1.07	.94	4.4
Dec. 18	2.2	.77	.96	1.11	.....	.....	.....	1.18	1.03	.92	4.2
Dec. 21	2.2	.....	.....	1.09	.....	.....	.....	.....	.....	.....	2.1
Dec. 26	1.4	.96	1.05	1.16	.....	.....	.....	.....	.....	.....	1.7
Dec. 27	3.2	.96	1.07	1.22	.....	.....	.....	1.27	1.05	.....	3.7
Means	.....	**.92**	**1.04**	**1.10**	.....	.....	.....	**1.18**	**1.02**	**.88**	.....
Departures	.....	**−.04**	**−.05**	**−.13**	.....	.....	.....	**−.01**	**−.04**	**−.07**	.....

TABLE 1.—*Solar radiation intensities during December 1944*—Con.

ALBUQUERQUE, N. MEX.

Date	Sun's zenith distance: 7:30 a. m.	78.7°	75.7°	70.7°	60.0°	0. 0°	60.0°	70.7°	75.7°	78.7°	1:30 p. m.
	75th mer. time	Air mass: A. M.				*1.0	P. M.				Local mean solar time
	e	5.0	4.0	3.0	2.0		2.0	3.0	4.0	5.0	e
	mb.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mb.*
Dec. 6	2.6	.....	.....	.....	.....	.....	.....	.....	1.09	0.95	3.8
Dec. 7	3.4	1.00	1.08	1.22	1.38	.....	1.41	1.31	1.22	1.19	4.0
Dec. 8	3.2	1.01	1.11	1.18	.....	.....	1.41	1.33	1.16	.....	4.0
Dec. 10	2.3	1.14	.....	1.34	1.46	.....	1.42	1.33	1.28	1.25	1.8
Dec. 11	1.5	.94	1.05	1.12	1.34	.....	1.37	.....	.....	.....	1.9
Dec. 12	2.9	.88	1.02	1.14	1.30	.....	1.33	1.22	1.14	1.11	2.2
Dec. 13	2.1	1.00	1.08	1.24	1.41	.....	1.42	1.22	1.22	1.21	2.3
Dec. 14	2.3	.99	1.11	1.21	1.39	.....	1.42	1.31	1.32	1.30	2.5
Dec. 16	2.5	.98	1.06	1.19	1.37	.....	1.35	1.33	1.30	1.27	3.2
Dec. 17	2.9	1.05	1.14	1.22	1.36	.....	1.22	1.29	1.24	1.21	2.5
Dec. 18	2.6	1.02	1.13	1.24	1.40	.....	1.41	1.28	1.17	1.07	2.9
Dec. 19	1.8	1.00	1.07	1.24	1.33	.....	1.31	1.15	1.06	.....	3.4
Dec. 20	1.9	.....	.....	1.08	1.28	.....	1.32	1.27	1.18	1.13	2.6
Dec. 21	2.6	.....	.....	1.16	1.33	.....	1.38	1.28	1.24	1.21	3.6
Dec. 22	2.6	.....	1.01	.....	1.31	.....	1.33	.....	.....	.....	3.3
Dec. 27	4.2	.....	.....	.....	.....	.....	1.37	1.14	.89	.....	4.4
Dec. 29	4.0	1.06	1.12	1.24	1.39	.....	1.40	1.36	1.31	1.27	4.0
Dec. 30	3.3	.90	1.05	1.20	.....	.....	.....	1.41	1.37	1.35	4.2
Dec. 31	4.4	.....	.....	1.11	1.42	.....	1.47	1.48	1.46	1.44	3.2
Means	.....	**1.00**	**1.08**	**1.20**	**1.36**	.....	**1.31**	**1.29**	**1.21**	**1.21**	.....
Departures	.....	**−.04**	**−.05**	**−.05**	**−.04**	.....	**−.09**	**+.02**	**+.05**	**+.11**	.....

BOSTON, MASS.

Dec. 4	2.7	0.75	0.78	0.92	.....	.....	.....	0.69	0.83	0.64	3.5
Dec. 5	3.0	.92	.99	1.01	.....	.....	.....	.84	.42	.....	3.3
Dec. 7	4.8	.46	.71	.77	.....	.....	.....	.60	.34	.18	6.4
Dec. 9	7.4	.82	.....	.96	.....	.....	.....	.....	.....	.....	5.6
Dec. 11	3.8	.53	.38	.....	.....	.....	.....	.....	.....	.....	4.4
Dec. 14	2.6	.....	.....	1.10	.....	.....	.....	.....	.....	.....	3.1
Dec. 15	2.7	.80	1.02	.98	.....	.....	.....	1.04	1.02	.83	3.1
Dec. 20	1.8	.50	.....	.....	.....	.....	.....	.....	.....	.....	2.7
Dec. 28	4.2	.72	.85	1.03	.....	.....	.....	.....	.96	.....	4.0
Means	.....	**.69**	**.79**	**.97**	.....	.....	.....	**.79**	**.71**	**.55**	.....

BLUE HILL, MASS.

Dec. 2	2.5	.....	.....	.....	.....	.....	.....	.....	1.07	.....	1.7
Dec. 3	1.6	0.95	1.04	1.20	.....	.....	.....	1.00	.93	0.80	1.9
Dec. 4	2.5	.91	.....	.....	.....	.....	.....	.....	.....	.....	3.3
Dec. 5	2.4	1.01	1.10	1.18	.....	.....	.....	.....	.....	.....	1.3
Dec. 7	4.6	.67	.80	.93	.....	.....	.....	.88	.76	.68	4.8
Dec. 10	3.8	.70	.79	.....	.....	.....	.....	.....	.....	.....	4.0
Dec. 11	3.6	.76	.95	1.00	.....	.....	.....	.....	.....	.....	3.8
Dec. 14	2.6	.....	.....	1.21	1.38	.....	.....	1.20	1.08	.97	2.4
Dec. 15	2.6	.91	1.14	1.27	1.40	.....	.....	1.21	1.02	.93	2.9
Dec. 22	1.2	.....	.....	.....	.....	.....	.....	1.12	.86	.72	1.1
Dec. 26	3.8	.....	.....	.....	.....	.....	1.40	1.25	1.14	1.03	1.9
Dec. 28	3.6	.88	.....	1.12	1.31	.....	.....	.....	.....	.88	2.9
Dec. 29	1.1	.....	.....	1.28	.....	.....	.....	1.27	1.13	1.01	1.0
Dec. 30	1.2	.97	1.06	1.17	.....	.....	.....	.....	.....	.....	2.5
Means	.....	**.86**	**.98**	**1.15**	**1.36**	.....	**(1.40)**	**1.13**	**1.00**	**.88**	.....
Departures	.....	**−.03**	**−.06**	**−.02**	**+.01**	.....	**+.10**	**−.01**	**−.03**	**−.08**	.....

Ratio, Boston/Blue Hill on comparable dates

	.....	0.81	0.78	0.86	.....	.....	.....	0.79	0.76	0.62	.....

*Extrapolated.

TABLE 2.—*Daily totals and weekly means of solar radiation (direct+diffuse) received on horizontal surface*

[Gram-calories per square centimeter]

Date 1944	Washington, D. C.	Madison, Wis.	Lincoln, Nebr.	East Lansing, Mich.	New York, N. Y.	Fresno, Calif.	Fairbanks, Alaska	Columbia, Mo.	Boston, Mass.	Nashville, Tenn.	Twin Falls, Idaho	La Jolla, Calif.	Riverside, Calif.	Blue Hill, Mass.	Ithaca, N. Y.	Newport, R. I.	State College, Pa.	Put-in-Bay, Ohio	East Wareham, Mass.	Davis, Calif.	Boulder, Colo.	Tooele, Utah	Illumination—Boston, Mass.
	cal.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*Avg. ft. candles*
Dec. 3	263	86	8	163	242	106	0	79	173	263	168	289	330	203	-----	188	258	183	42	273	186	186	1,522
Dec. 4	264	73	12	77	216	254	0	75	159	155	151	289	347	191	203	157	252	129	61	250	190	288	1,464
Dec. 5	249	40	157	72	205	257	0	22	141	140	155	293	307	191	201	194	219	134	231	253	225	294	1,381
Dec. 6	186	74	215	35	89	245	0	70	72	53	178	291	296	174	77	176	84	71	206	256	218	303	706
Dec. 7	113	124	215	43	160	193	4	65	119	17	182	282	285	171	156	178	116	52	192	241	165	293	1,123
Dec. 8	31	122	177	26	10	102	0	130	30	206	41	171	222	41	18	40	13	51	51	194	209	273	343
Dec. 9	160	63	56	34	158	86	5	40	142	133	169	267	232	172	151	188	98	67	230	168	162	315	1,419
Mean	**181**	**83**	**120**	**64**	**154**	**177**	**1**	**69**	**120**	**138**	**149**	**269**	**289**	**163**	**134**	**160**	**148**	**98**	**145**	**234**	**194**	**274**	**1,137**
Departure	**+20**	**−33**	**−53**	**−19**	**+27**	**−11**	**−6**	-----	-----	**+17**	**+24**	**+25**	**+70**	**+23**	**+34**	**+17**	**+27**	**−12**	**−3**	**+42**	-----	-----	-----
Dec. 10	228	55	150	59	90	152	0	47	134	69	194	271	282	162	139	190	71	120	219	164	259	330	1,290
Dec. 11	37	83	206	34	104	208	0	74	82	55	188	214	156	157	52	139	26	16	155	220	172	308	805
Dec. 12	107	220	112	169	16	184	0	242	53	59	184	276	294	57	54	38	101	136	145	207	232	303	606
Dec. 13	251	220	225	78	195	232	2	151	162	80	201	257	259	188	74	141	158	48	231	160	224	306	1,503
Dec. 14	188	177	220	122	195	150	6	251	169	199	195	107	108	207	167	207	111	73	229	109	221	295	1,464
Dec. 15	245	150	85	88	151	206	1	209	158	243	189	213	270	211	158	201	191	126	231	228	220	276	1,382
Dec. 16	145	191	214	72	45	241	0	172	56	154	157	252	256	80	55	83	80	71	93	232	217	255	583
Mean	**172**	**157**	**173**	**89**	**115**	**196**	**1**	**164**	**116**	**123**	**187**	**227**	**232**	**152**	**99**	**143**	**105**	**84**	**186**	**189**	**220**	**295**	**1,090**
Departure	**+31**	**+40**	**+13**	**−10**	**−1**	**+25**	**−4**	-----	-----	**−12**	**+60**	**−12**	**+32**	**+15**	**−20**	**−3**	**−15**	**−36**	**+29**	**+21**	-----	-----	-----
Dec. 17	244	142	144	33	179	160	2	170	108	247	129	230	222	148	160	147	186	117	161	177	128	288	1,074
Dec. 18	131	207	206	123	101	199	1	208	139	7	132	257	284	186	153	131	63	137	151	60	219	252	1,318
Dec. 19	236	218	152	105	211	85	0	230	38	219	126	216	236	66	206	66	163	150	55	22	209	242	392
Dec. 20	114	118	144	82	112	230	0	192	128	239	44	266	278	177	85	172	150	155	185	204	175	102	1,248
Dec. 21	78	235	220	119	56	82	4	230	82	60	138	162	212	100	106	66	95	151	72	27	213	261	811
Dec. 22	161	81	190	141	156	98	7	233	141	59	50	113	38	205	208	211	224	211	227	130	94	105	1,129
Dec. 23	134	224	152	74	32	211	1	58	45	30	96	217	170	74	84	37	161	40	82	178	203	126	458
Mean	**157**	**175**	**173**	**97**	**121**	**152**	**2**	**189**	**97**	**123**	**102**	**209**	**206**	**137**	**143**	**119**	**149**	**137**	**133**	**114**	**177**	**196**	**919**
Departure	**+8**	**+54**	**+2**	**−1**	**+9**	**+1**	**−4**	-----	-----	**−3**	**−19**	**−27**	**−12**	**0**	**+44**	**−21**	**+35**	**+21**	**−23**	**−10**	-----	-----	-----
Dec. 24	54	66	165	56	25	97	-----	38	100	17	97	140	111	109	-----	67	50	118	113	251	228	126	862
Dec. 25	45	200	212	55	19	64	-----	58	6	22	184	154	164	19	10	16	16	15	27	75	222	113	57
Dec. 26	162	214	154	186	176	156	-----	192	127	90	138	273	276	147	186	142	230	330	149	27	151	82	1,157
Dec. 27	37	83	243	25	67	128	0	51	54	7	173	259	241	135	60	122	35	32	140	24	224	278	537
Dec. 28	198	205	107	165	216	218	5	148	155	19	82	267	262	182	114	153	157	228	191	83	222	105	1,420
Dec. 29	104	117	42	70	146	267	12	56	181	38	162	212	234	219	178	210	182	114	242	160	215	271	1,578
Dec. 30	32	62	48	66	91	241	0	29	64	35	148	289	312	191	117	194	65	49	219	132	244	244	583
Dec. 31	38	29	202	12	29	148	0	41	24	12	184	282	309	45	54	40	49	26	-----	220	178	325	270
Mean (8-day)	**84**	**122**	**168**	**79**	**96**	**165**	**3**	**77**	**89**	**30**	**146**	**234**	**239**	**131**	**103**	**118**	**98**	**130**	**154**	**122**	**210**	**193**	**808**
Departure	**−61**	**+6**	**+8**	**−3**	**−27**	**+22**	**−3**	-----	-----	**−62**	**+15**	**+8**	**+35**	**+6**	**+8**	**−17**	**−1**	**+34**	**+8**	**−5**	-----	-----	-----

ACCUMULATED DEPARTURES ON DEC. 31, 1944

	−5,665	**−582**	**−10,580**	-----	**−5,318**	**+3,552**	-----	-----	-----	**+3,599**	-----	-----	-----	**−137**	-----	**−6,003**	**−1,155**	**+1,851**	**+2,775**	**−2,088**	-----	-----	-----

PERCENTAGE DEPARTURES FOR THE YEAR

	−4.6	**−0.5**	**−7.9**	-----	**−4.7**	**+2.2**	-----	-----	-----	**+3.0**	-----	-----	-----	**−0.1**	-----	**−4.7**	**−1.0**	**+1.7**	**+2.3**	**−1.2**	-----	-----	-----

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR DECEMBER 1944

By LUCY T. DAY

[Equatorial Division, U. S. Naval Observatory]

[Communicated by Commodore J. F. Hellweg, U. S. N. (Ret.) Superintendent, U. S. Naval Observatory.] All measurements and spot counts were made at the Naval Observatory from plates taken at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's hemisphere. For each day, under longitude, latitude, area of spot or group, and spot count are included assumed longitude of center of the disk, assumed latitude of center of the disk, total areas of spots and groups and total spot count.

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1944	h m		°	°	°	°				
Dec. 1	12 30			No spots						†Mt. Wilson.
2	12 0			No spots						†Do.
3	11 45			No spots						†Do.
4	12 0			No spots						†Do.
5	10 22	7692	−64	109	−18	66	16	2	G	U. S. Naval.
				(173)	(0)		16	2		
6	10 46	7692	−50	109	−19	53	12	3	F	Do.
		7693	−32	127	+23	39	12	1		
		7693	−28	131	+22	35	36	6		
				(159)	(0)		60	10		
7	11 26	7692	−34	112	−18	38	6	1	G	Mt. Wilson.
		7693	−17	129	+24	30	12	1		
		7693	−15	131	+23	28	6	1		
		7693	−13	133	+23	26	36	1		
				(146)	(0)		60	4		
8	15 9	7695	−77	55	−23	78	388	7	P	Do.
		7693	+1	133	+24	24	48	1		
		7694	+72	205	+25	74	6	1		
				(132)	(0)		442	9		
9	10 12	7695	−67	53	−21	69	533	1	P	U. S. Naval.
		7695	−64	56	−22	66	436	1		
		7693	+11	131	+23	26	194	3		
				(120)	(0)		1,163	5		
10	10 33	7695	−62	45	−25	65	48	3	G	Do.
		7695	−57	50	−23	60	24	2		
		7695	−53	54	−22	57	558	9		
		7695	−48	59	−23	52	436	12		
		7696	+5	112	−15	15	12	1		
		7693	+23	130	+24	34	24	4		
		7693	+27	134	+25	37	6	2		
		7693	+28	135	+22	36	97	10		
				(107)	(0)		1,205	43		
11	16 30	7695	−47	43	−24	51	48	10	F	Mt. Wilson.
		7695	−47	43	−27	52	24	6		
		7695	−39	51	−22	43	73	8		
		7695	−37	53	−22	42	533	6		
		7695	−32	58	−22	38	436	5		
		7695	−28	62	−22	36	48	1		
		7693	+42	132	+24	48	24	1		
		7693	+48	138	+23	52	97	1		
				(90)	(0)		1,283	38		
12	10 48	7695	−45	35	−25	50	12	4	G	Do.
		7695	−36	44	−25	42	73	12		
		7695	−29	51	−23	36	36	9		
		7695	−27	53	−22	33	509	12		
		7695	−21	59	−22	30	436	13		
		7695	−18	62	−22	28	61	5		
		7693	+59	139	+23	61	73	1		
				(80)	(−1)		1,200	56		
13	10 1	7697	−88	329	+22	88	339	1	F	U. S. Naval.
		7695	−37	30	−29	44	24	3		
		7695	−35	32	−26	41	24	2		
		7695	−25	42	−24	33	12	1		
		7695	−17	50	−22	27	61	3		
		7695	−13	54	−21	23	388	5		
		7695	−9	58	−21	21	339	7		
		7695	−4	63	−21	20	48	5		
		7693	+69	136	+23	70	48	2		
				(67)	(−1)		1,283	29		
14	10 26	7697	−73	341	+22	76	388	1	F	Do.
		7695	−10	44	−25	26	48	4		
		7695	−4	50	−22	21	36	1		
		7695	−1	53	−21	20	194	3		

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR DECEMBER 1944—Continued

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1944	h m		°	°	°	°				
Dec. 14	10 26	7695	−1	53	−22	21	242	2		U. S. Naval.
		7695	+3	57	−21	20	218	5		
		7695	+6	60	−22	21	121	2		
		7695	+9	63	−20	20	61	4		
				(54)	(−1)		1,308	22		
15	10 37	7697	−58	343	+22	60	339	1	G	Do.
		7695	+12	53	−22	23	242	2		
		7695	+14	55	−22	26	194	3		
		7695	+17	56	−21	27	48	6		
		7695	+18	59	−22	27	48	1		
		7695	+19	60	−22	28	121	6		
		7695	+20	61	−22	28	97	3		
		7695	+23	64	−20	29	36	1		
				(41)	(−1)		1,125	23		
16	12 43	7697	−43	343	+22	49	291	1	F	Do.
		7695	+28	54	−21	36	206	4		
		7695	+30	56	−22	35	194	2		
		7695	+32	58	−21	37	170	7		
		7695	+33	59	−22	39	145	5		
		7695	+38	64	−20	41	12	1		
				(26)	(−1)		1,018	20		
17	12 55	*	−63	310	−29	66	24	2	P	Do.
		7699	−50	323	−29	56	6	1		
		7697	−30	343	+21	37	242	1		
		7698	+17	30	+27	33	36	1		
		7698	+21	34	+26	34	6	1		
		7695	+41	54	−22	45	339	5		
		7695	+46	59	−21	48	145	2		
		7695	+46	59	−22	49	145	2		
				(13)	(−1)		943	15		
18	10 50	7701	−58	303	−33	62	16	2	F	Do.
		7699	−41	320	−29	49	61	4		
		7697	−17	344	+22	29	242	1		
		7698	+28	29	+33	43	48	4		
		7698	+28	29	+27	39	73	3		
		7698	+31	32	+33	45	109	1		
		7698	+31	32	+25	40	48	1		
		7695	+51	52	−21	55	97	1		
		7695	+54	55	−22	56	194	1		
		7695	+57	58	−22	59	194	4		
				(1)	(−1)		1,082	22		
19	10 31	7702	−82	266	−5	82	6	1	F	Do.
		7699	−31	317	−29	40	121	9		
		7699	−29	319	−29	38	121	1		
		7697	−3	345	+22	24	218	1		
		7700	+40	28	+32	57	73	7		
		7698	+40	28	+27	48	48	5		
		7698	+44	32	+25	51	24	2		
		7700	+47	35	+33	57	194	1		
		7695	+64	52	−22	66	73	1		
		7695	+67	55	−23	69	170	1		
		7695	+70	58	−22	71	97	2		
				(348)	(−2)		1,145	31		
20	12 1	7703	−85	249	+26	85	97	1	G	Mt. Wilson.
		7702	−69	265	−7	69	24	2		
		7699	−17	317	−29	31	24	8		
		7699	−12	322	−29	28	61	1		
		7697	+10	344	+22	26	242	1		
		7700	+51	25	+23	56	24	3		
		7698	+51	25	+27	59	24	4		
		7700	+59	33	+23	61	73	1		
		7695	+70	44	−25	71	24	3		
		7695	+80	54	−22	80	291	4		
				(334)	(−2)		884	28		
21	10 17	7703	−70	252	+26	73	121	3	F	U. S. Naval.
		7702	−57	265	−6	57	12	1		
		7699	−7	315	−32	32	48	2		
		7699	−1	321	−30	29	48	2		
		7699	+1	323	−29	28	73	2		
		7697	+22	344	+22	32	194	1		
		7700	+70	32	+23	73	97	1		
				(322)	(−2)		593	12		
22	12 52	7703	−63	244	+28	68	48	2	F	Do.
		7703	−56	251	+27	61	170	3		
		7702	−41	266	−5	41	48	5		
		7699	+7	314	−31	30	61	3		
		7699	+14	321	−29	30	48	4		
		7699	+14	321	−29	30	48	4		
		7699	+17	324	−29	31	97	8		
		7697	+36	343	+22	42	218	1		
				(307)	(−2)		690	26		

POSITIONS, AREAS, AND COUNTS OF SUNSPOTS FOR DECEMBER 1944—Continued

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1944	h m		°	°	°	°				
Dec. 23	12 54	7703	−50	244	+28	57	48	3	F	U. S. Naval
		7703	−42	252	+26	49	170	7		
		7699	+28	322	−29	37	97	5		
		7699	+31	325	−28	39	121	3		
		7697	+49	343	+22	52	218	1		
				(294)	(−2)		654	19		
24	13 8	7703	−39	242	+28	47	24	6	G	Mt. Wilson
		7703	−30	251	+26	40	48	18		
		7703	−28	253	+27	40	97	1		
		7699	+39	320	−31	46	24	2		
		7699	+40	321	−31	47	109	7		
		7699	+48	329	−30	52	109	7		
		7697	+62	343	+22	64	218	1		
				(281)	(−2)		629	42		
25	11 18	7703	−27	242	+29	40	16	4	VG	Do.
		7703	−24	245	+26	36	48	1		
		7703	−19	250	+26	33	61	16		
		7703	−16	253	+27	32	145	1		
		7699	+50	319	−31	56	73	2		
		7699	+52	321	−30	56	145	8		
		7699	+62	331	−31	66	97	2		
		7697	+76	345	+22	78	194	1		
				(269)	(−2)		779	35		
26	13 6	7703	−11	243	+28	33	97	7	P	U. S. Naval
		7703	−3	251	+28	30	218	6		
		7699	+63	317	−27	66	194	10		
		7699	+74	328	−28	75	194	1		
				(254)	(−2)		703	24		
27	11 9	7703	+2	244	+28	30	73	7	F	Mt. Wilson
		7703	+10	252	+27	31	121	10		
		7704	+13	255	+15	21	48	3		
		7699	+75	317	−30	77	121	4		
				(242)	(−2)		363	24		
28	11 11	7703	+13	242	+30	36	61	7	G	U. S. Naval
		7703	+15	244	+27	34	24	10		
		7703	+23	252	+28	37	97	3		
		7704	+27	256	+15	32	48	5		
				(229)	(−3)		230	25		
29	16 31	7703	+27	240	+28	40	12	1	F	Mt. Wilson
		7703	+38	251	+25	46	48	1		
		7704	+41	254	+15	45	16	3		
				(213)	(−3)		76	5		
30	10 59	7703	+50	253	+25	58	48	1	P	Do.
				(203)	(−3)		48	1		
31	10 49	7703	+64	254	+25	68	36	1	G	Do.
				(190)	(−3)		36	1		

Mean daily area for 31 days=613.

†Data from Mount Wilson charts.]
*Not numbered.

VG=very good; G=good; F=fair; P=poor.

PROVISIONAL RELATIVE SUNSPOT NUMBERS

[Based on observations at Zurich except as indicated by an asterisk. Data furnished through the courtesy of Prof. W. Brunner, Swiss Federal Observatory, Zurich, Switzerland.]

Date	Relative numbers	Date	Relative numbers	Date	Relative numbers
Oct.		*Oct.*		*Oct.*	
1	*d* 42	11	7	21	*a* 17
2	32	12	7	22	*18
3	46	13	0	23	*13
4	41	14	0	24	9
5	23	15	*d* 8	25	*11
6	15	16		26	*10
7	*a* 8	17	*Mc* 23	27	*9
8	16	18	*a* 21	28	14
9	20	19	*11	29	*d* 11
10	*Wc* 17	20	17	30	18
				31	17

Mean, 30 days=16.7

Date	Relative numbers	Date	Relative numbers	Date	Relative numbers
Nov.		*Nov.*		*Nov.*	
1	11	11	11	21	11
2	11	12	16	22	*a* *11
3	*a* *12	13		23	*11
4	12	14	0	24	24
5	14	15	0	25	23
6	14	16	*d* 9	26	17
7	*0	17	9	27	*20
8	*0	18	11	28	19
9	0	19	11	29	*8
10	*0	20	10	30	8

Mean, 29 days=10.4

*=Observed at Locarno.

a=Passage of an average sized group through the central meridian.

b=Passage of a large group through the central meridian.

c=New formation of a group developing into a middle sized or large center of activity; E, on the eastern part of the Sun's disc; W, on the western part; M, in the central circle zone.

d=Entrance of a large or average sized center of activity on the east limb.

Chart I. Departure (°F.) of the Mean Temperature from the Normal, and Wind Roses for Selected Stations, December 1944

Chart I. Departure (°F.) of the Mean Temperature from the Normal, and Wind Roses for Selected Stations, December 1944

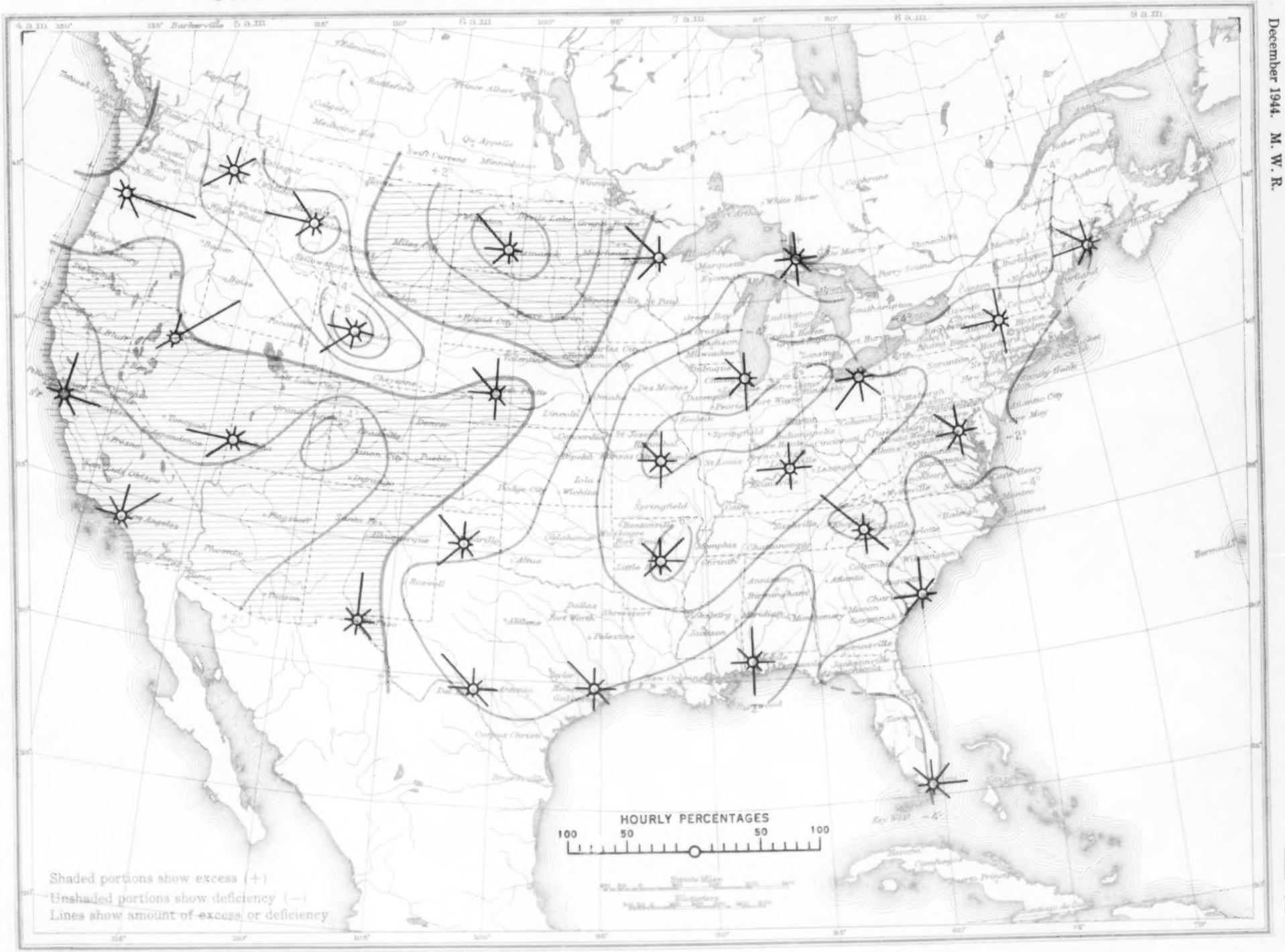
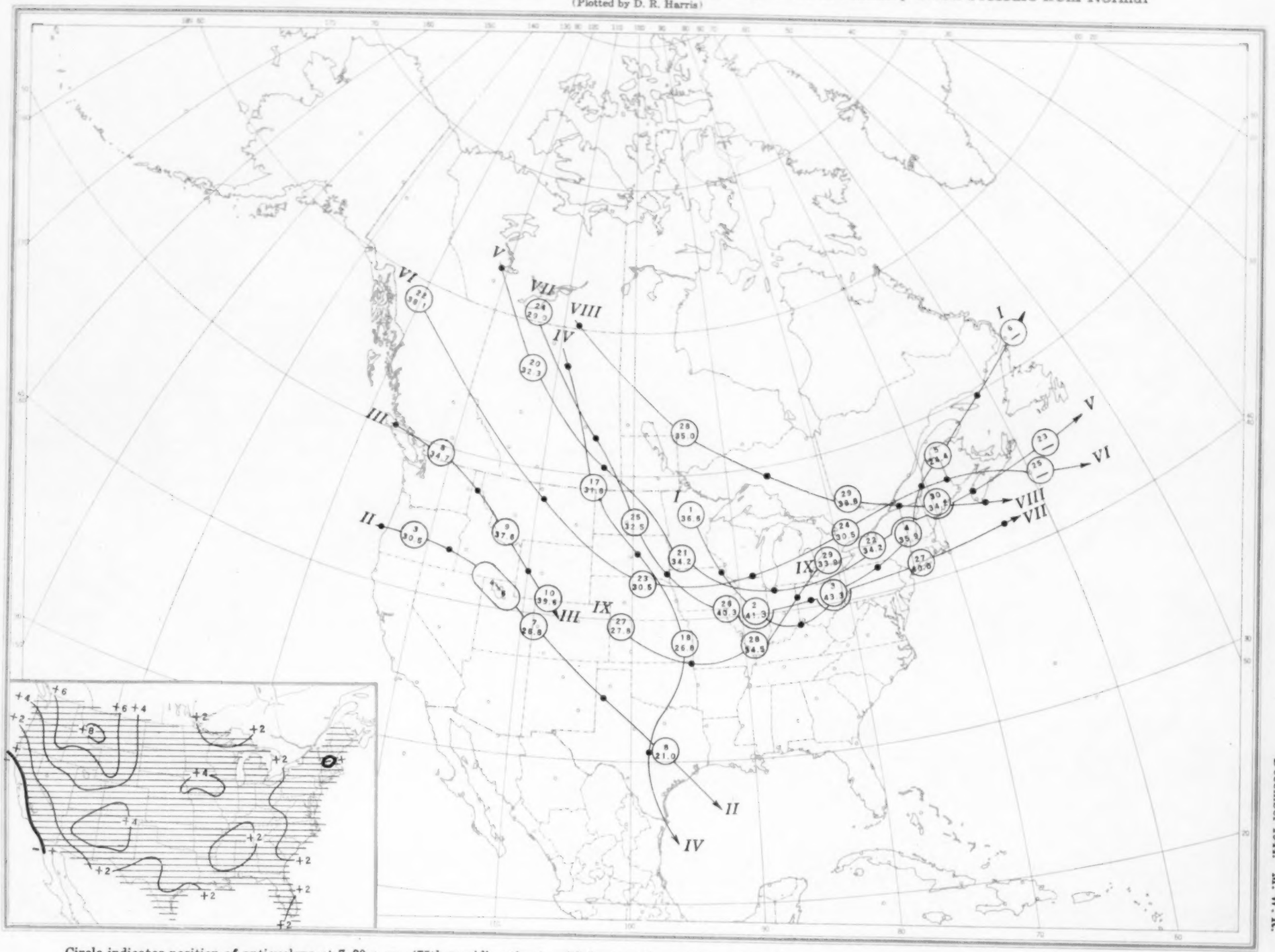

HOURLY PERCENTAGES
100 50 50 100
Shaded portions show excess (+)
Unshaded portions show deficiency (−)
Lines show amount of excess or deficiency

Chart II. Tracks of Centers of Anticyclones, December 1944. (Inset) Departure of Monthly Mean Pressure from Normal

(Plotted by D. R. Harris)

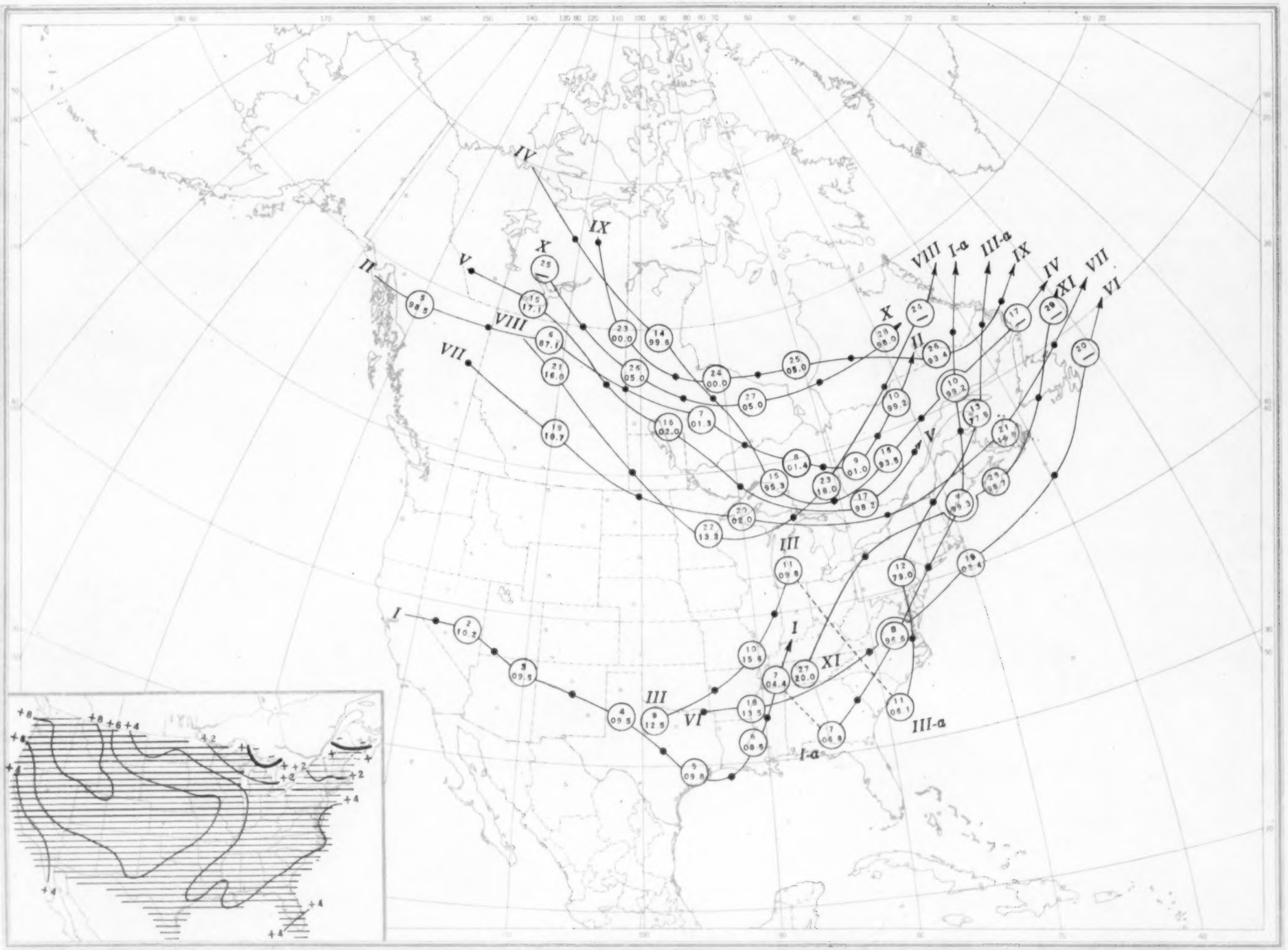


Circle indicates position of anticyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 7:30 p. m. (75th meridian time)

Chart III. Tracks of Centers of Cyclones, December 1944. (Inset) Change in Mean Pressure from Preceding Month

Chart III. Tracks of Centers of Cyclones, December 1944. (Inset) Change in Mean Pressure from Preceding Month

(Plotted by D. R. Harris)



Circle indicates position of cyclone at 7:30 a. m. (75th meridian time), with barometric reading. Dot indicates position of cyclone at 7:30 p. m. (75th meridian time)

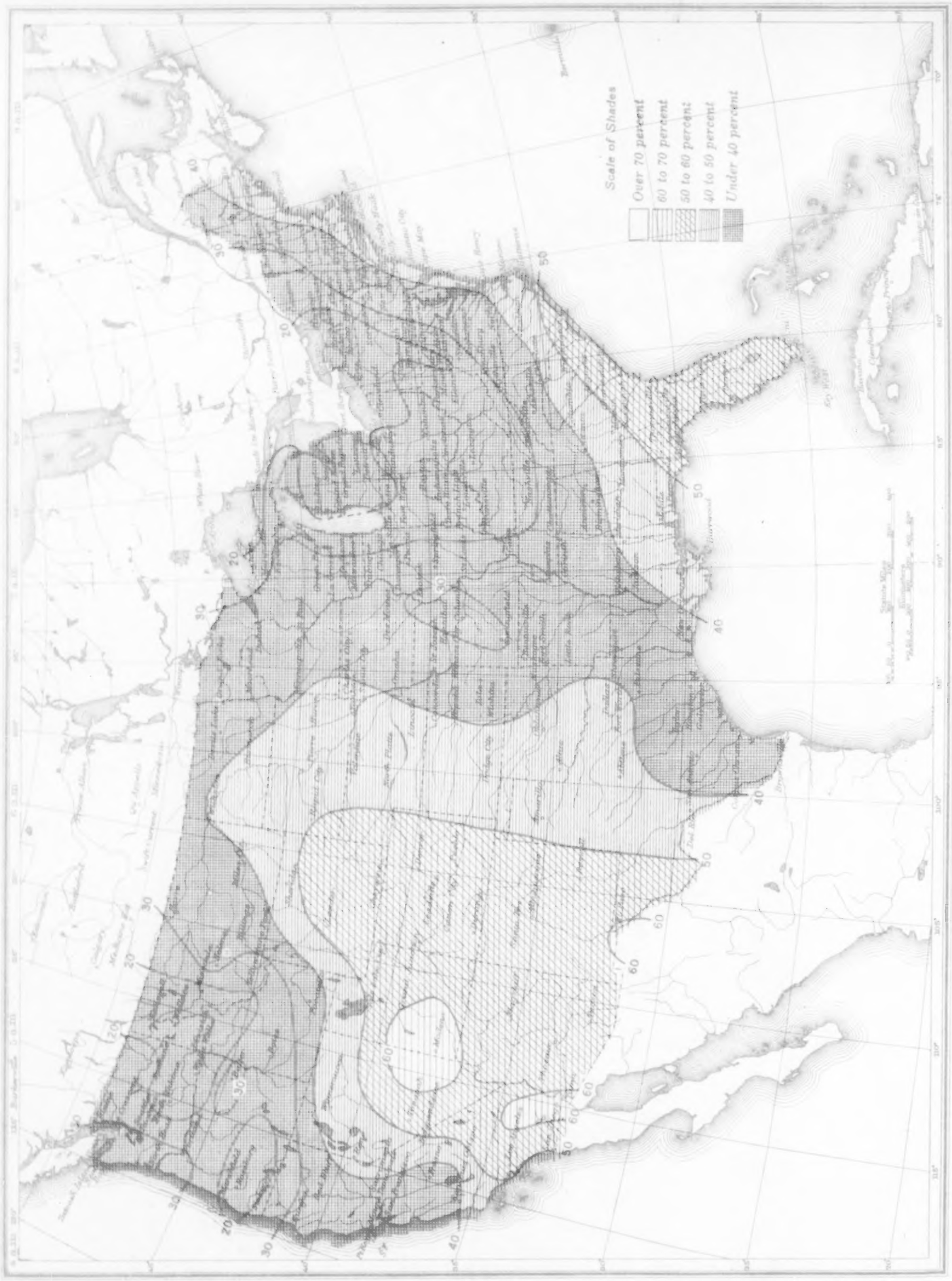


Chart IV. Percentage of Clear Sky Between Sunrise and Sunset, December 1944

Chart V. Total Precipitation, Inches, December 1944. (Inset) Departure of Precipitation from Normal

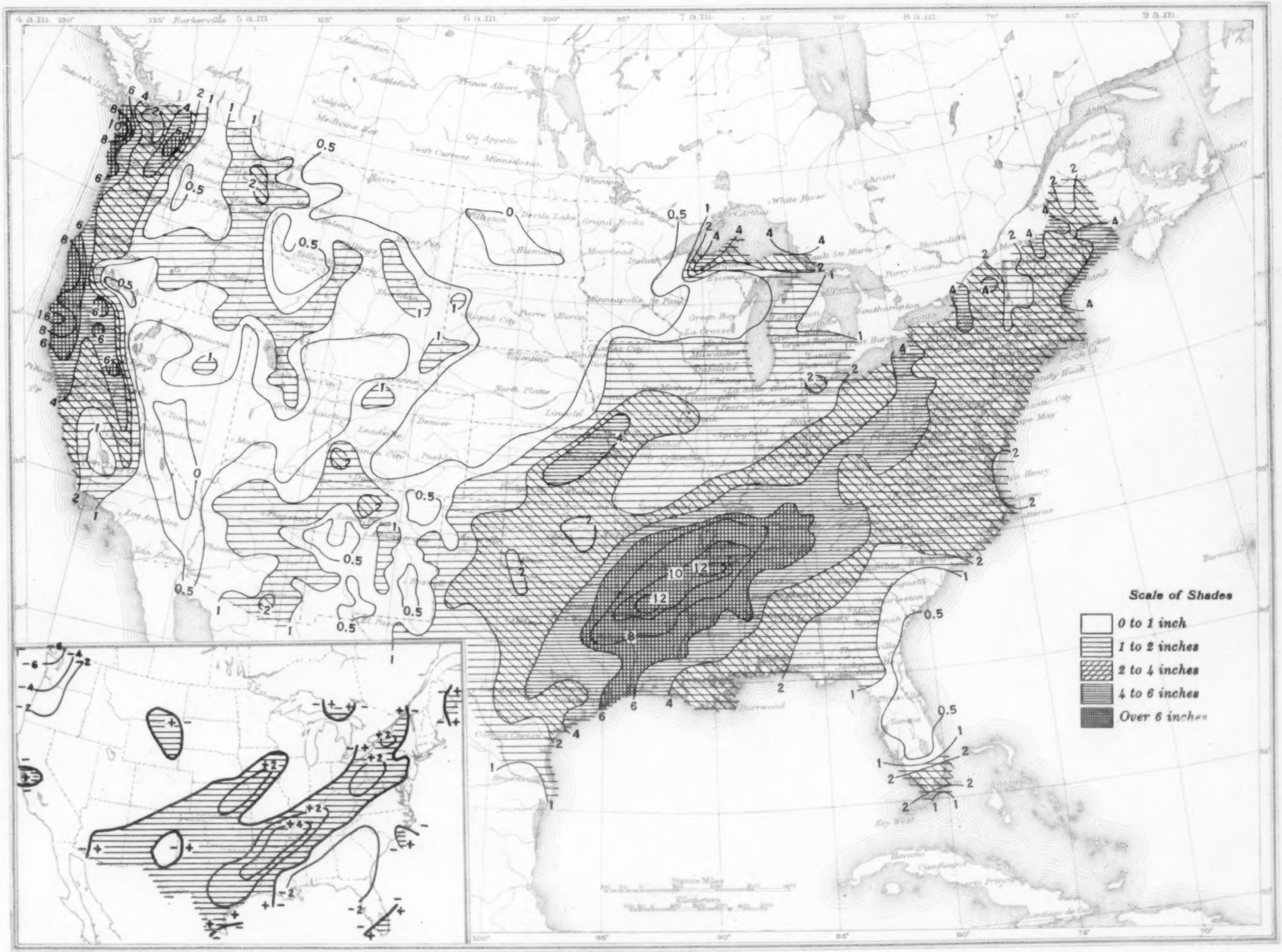


Chart VI. Isobars (mb), at Sea Level and Isotherms °F at Surface; Prevailing Winds, December 1944

Chart VII. Total Snowfall, Inches, December 1944. (Inset) Depth of Snow on the Ground at 7:30 p. m., Monday, January 1, 1945

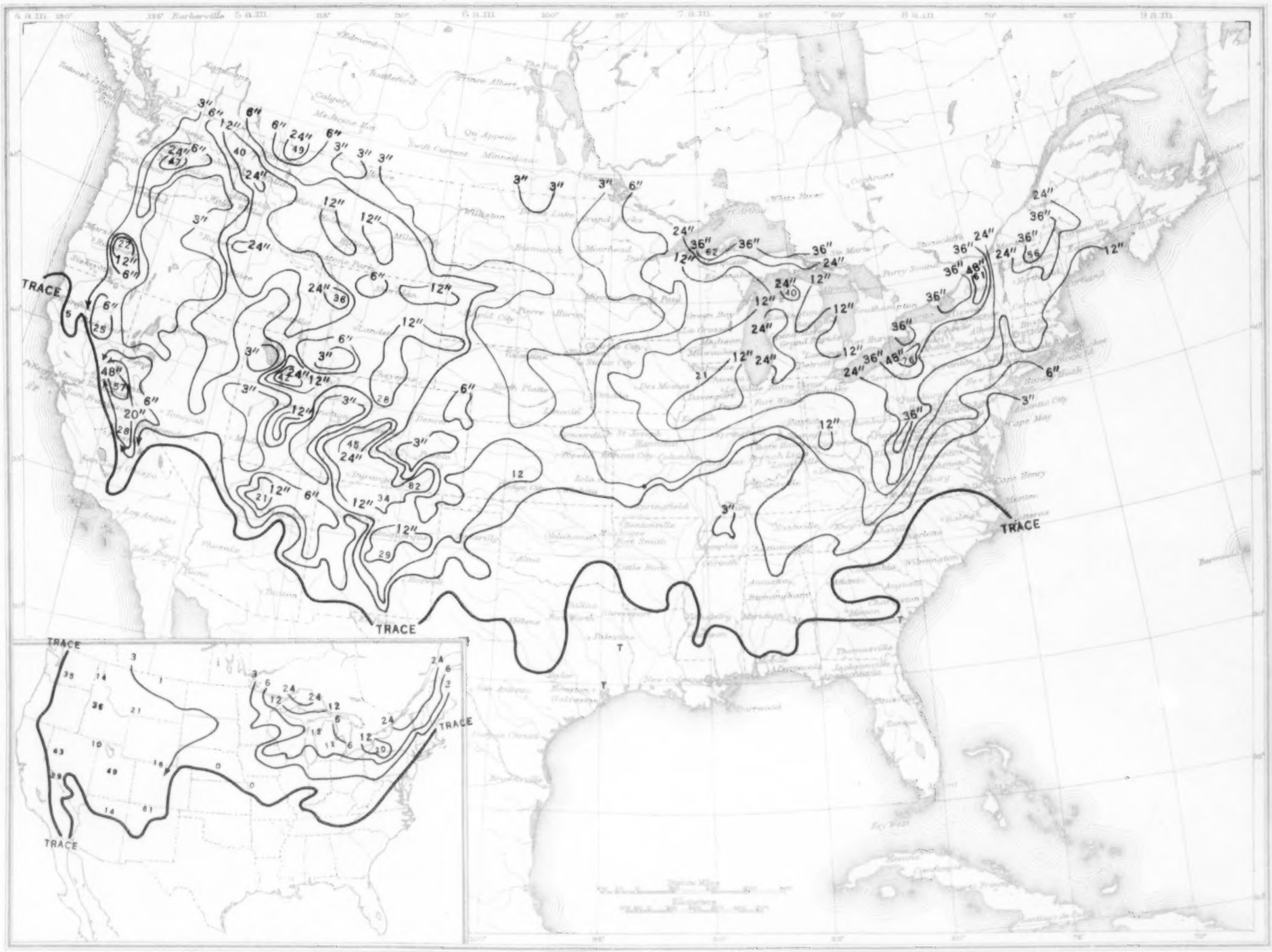


Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.) and Isotherms (°C.) and Resultant Winds for 1,500 Meters (m. s. l.) December 1944

Chart VIII. Isobars (mb) for 1,524 Meters (5,000 ft.), and Isotherms (°C.), and Resultant Winds for 1,500 Meters (m. s. l.) December 1944

Isobars and isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).

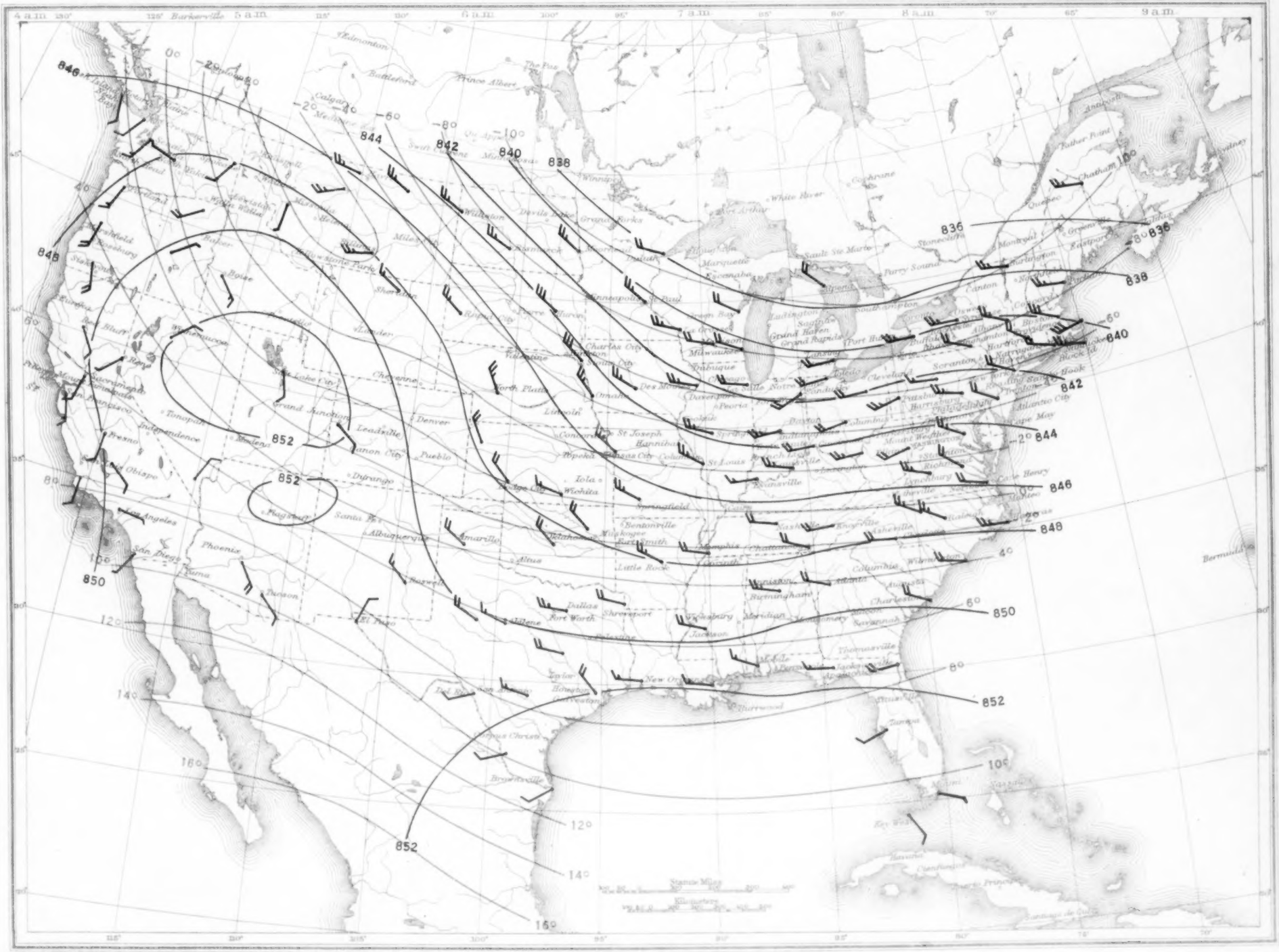
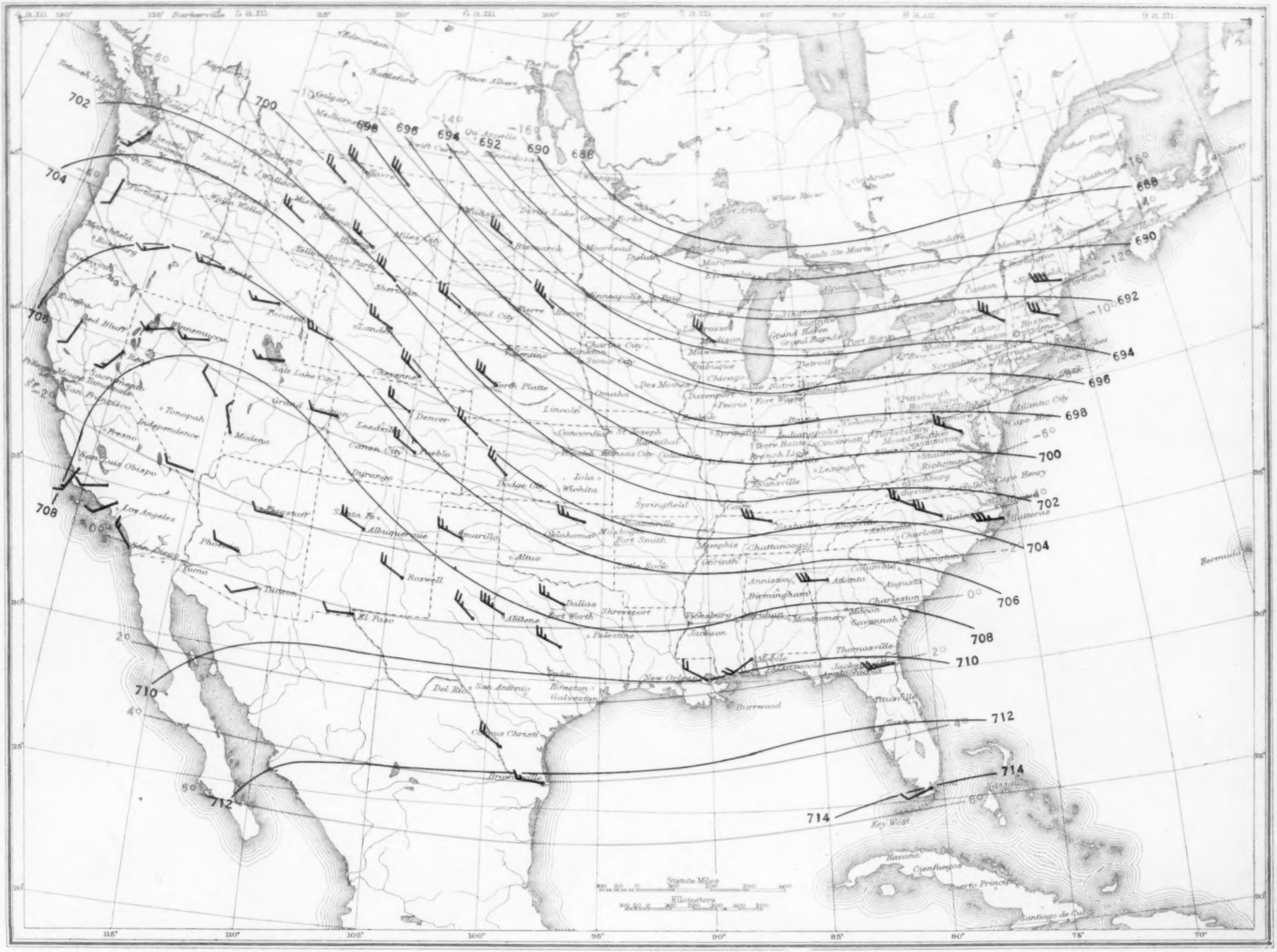


Chart IX. Isobars (mb), Isotherms (°C.), and Resultant Winds for 3,000 Meters (m. s. l.) December 1944

Isobars and isotherms based on radiosonde observations 11:00 p. m. at (E. S. T.) and winds based on pilot-balloon observations at 5:00 a. m. (E. S. T.).


Barkerville
Edmonton
Battleford
Prince Albert
The Pas
Calgary
Medicine Hat
Kamloops
Spokane
Lewiston
Portland
Baker
Boise
Winnemucca
Red Bluff
Eureka
Yellowstone Park
Miles City
Sheridan
Rapid City
Pierre
Bismarck
Moorhead
Duluth
Minneapolis
St. Paul
Aberdeen
Huron
Sioux City
Omaha
North Platte
Lincoln
Grand Island
Cheyenne
Salt Lake City
Denver
Leadville
Canon City
Pueblo
Grand Junction
Tonopah
Independence
Fresno
Modena
San Francisco
Mount Tamalpais
San Luis Obispo
Los Angeles
San Diego
Phoenix
Yuma
Tucson
Flagstaff
Santa Fe
Albuquerque
Amarillo
Roswell
El Paso
Abilene
Dallas
Fort Worth
Wichita
Hutchinson
Kansas City
Topeka
Concordia
St. Joseph
Hannibal
Springfield
Columbia
Fort Smith
Little Rock
Oklahoma
Shreveport
Vicksburg
Jackson
Meridian
Montgomery
Mobile
New Orleans
Galveston
Houston
San Antonio
Del Rio
Corpus Christi
Brownsville
Palestine
Taylor
Waco
Altus
Tola
Lodge City
Chicago
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Detroit
Toledo
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Escanaba
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Sault Ste Marie
Port Arthur
White River
Nipigon
Moosonee
Moose Factory
Timmins
Sudbury
Parry Sound
Stonecliffe
Montreal
Quebec
Anticosti
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Gaspé
Anticosti
Chatham
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Moncton
Charlottetown
Halifax
Yarmouth
Sydney
Newfoundland
Bermuda
Cleveland
Akron
Youngstown
Pittsburgh
Harrisburg
Reading
Scranton
Wilkes-Barre
Allentown
Atlantic City
Cape May
Trenton
Philadelphia
Wilmington
Baltimore
Washington
Cumberland
Parkersburg
Mount Weather
Martinsburg
Staunton
Richmond
Lynchburg
Norfolk
Cape Henry
Hatteras
Elkins
Charleston
Beckley
Bluefield
Roanoke
Lexington
Bristol
Knoxville
Asheville
Charlotte
Greenville
Columbia
Augusta
Savannah
Jacksonville
Tallahassee
Apalachicola
Pensacola
Thomasville
Tuscaloosa
Birmingham
Anniston
Atlanta
Chattanooga
Memphis
Corinth
Nashville
Evansville
Indianapolis
Terre Haute
Lafayette
Peoria
Springfield
Decatur
Champaign
Danville
Fort Wayne
Kokomo
Muncie
Indianapolis
Terre Haute
Evansville
Louisville
Cincinnati
Columbus
Zanesville
Wheeling
Clarksburg
Parkersburg
Huntington
Ashland
Grand Rapids
Muskegon
Lansing
Flint
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Buffalo
Rochester
Syracuse
Albany
Utica
Binghamton
Elmira
Watertown
Oswego
Massena
Ogdensburg
Plattsburgh
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Boston
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Wilmington
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Abilene
Dallas
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Shreveport
Vicksburg
Jackson
Meridian
Montgomery
Mobile
New Orleans
Galveston
Houston
San Antonio
Del Rio
Corpus Christi
Brownsville
Key West
Havana
Cienfuegos
Puerto Principe
Santiago de Cuba
Bermuda
Statute Miles
Kilometers
115°
110°
105°
100°
95°
90°
85°
80°
75°
70°
702
704
706
708
710
712
714
716
718
720
722
724
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728
730
732
734
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740
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766
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770
772
774
776
778
780

Chart X. Isobars (mb), Isotherms (°C.), and Resultant Winds for 5,000 Meters (m. s. l.) December 1944

Isobars and isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).

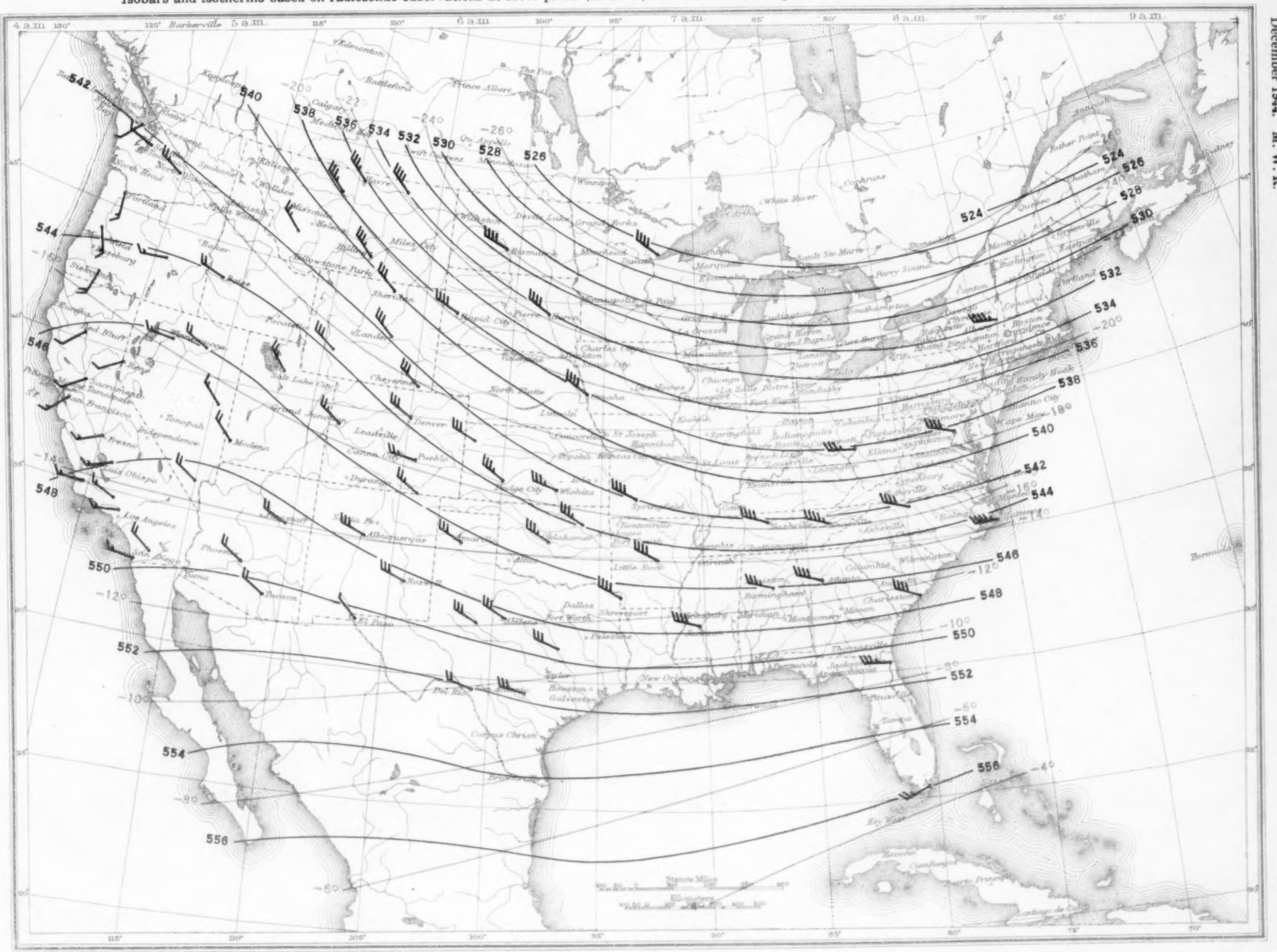
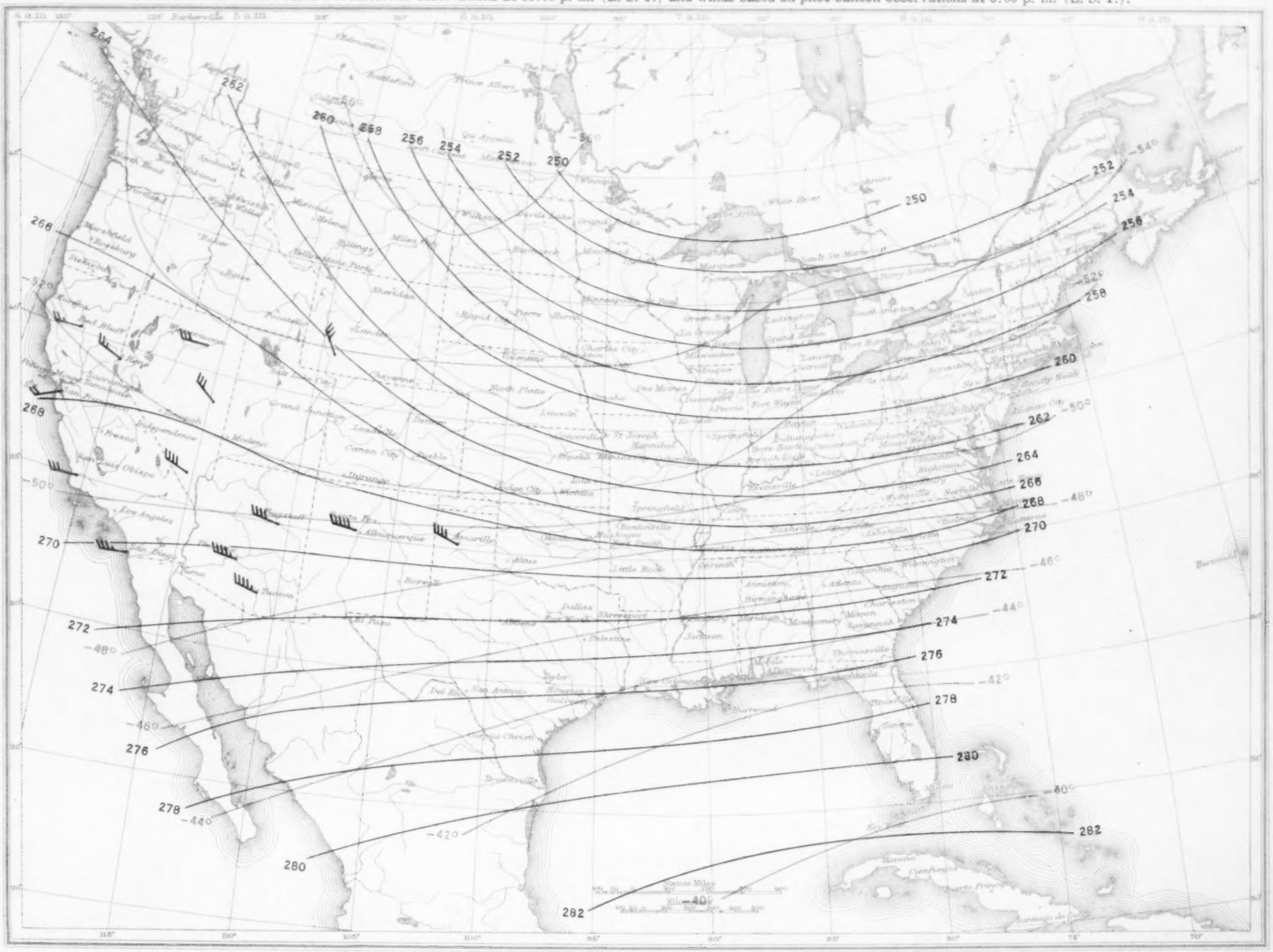


Chart XI. Isobars (mb), Isotherms (°C.), and Resultant Winds for 10,000 Meters (m. s. l.) December 1944

Isobars and isotherms based on radiosonde observations at 11:00 p. m. (E. S. T.) and winds based on pilot-balloon observations at 5:00 p. m. (E. S. T.).



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MONTHLY WEATHER REVIEW

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